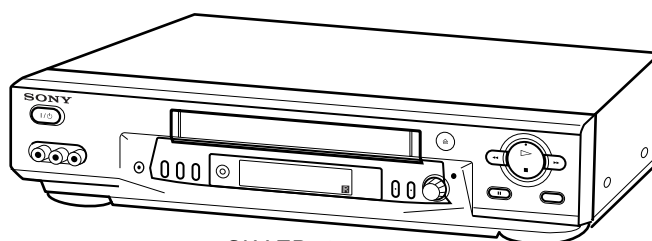
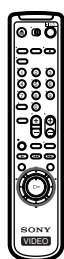


# SLV-ED115/ED215/ED313/ED515/ED616/ED815/ED817/ ED818/ED915/ED919/EZ111/EZ212/EZ414/ EZ715/EZ717 RMT-V309/V311/V311A/V311B/V311C/V311D/V311E

## SERVICE MANUAL



SLV-ED818

### *Australian Model*

SLV-EZ111AZ/EZ212AZ/EZ414AZ/  
EZ715AS/EZ717AS

### *E Model*

SLV-ED115PS/ED215PS/ED515PS/  
ED815PS//ED817PS/ED915PS

### *Hong Kong Model*

SLV-ED919MI

### *ME Model*

SLV-ED313ME/ED313MJ/ED313SG/  
ED616ME/ED616MJ/ED616SG/  
ED818ME/ED818SG

### *New Zealand Model*

SLV-EZ715NZ/EZ717NZ

### *Thai Model*

SLV-ED215TH/ED815TH/ED817TH/  
ED915TH

S MECHANISM

Hi-Fi

**G-CODE**

- Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENTS VI for MECHANICAL ADJUSTMENTS. (9-921-647-11)

\* The abbreviations of ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ111/EZ212/EZ414/EZ715 and EZ717 contained in this service manual are indicated when these models are common to all their corresponding models as given below.

| Abbreviated model name | ED115   | ED215              | ED313                         | ED515   | ED616                         | ED815              | ED817              | ED818              | ED915              | ED919   | EZ111   | EZ212   | EZ414   | EZ715              | EZ717              |
|------------------------|---------|--------------------|-------------------------------|---------|-------------------------------|--------------------|--------------------|--------------------|--------------------|---------|---------|---------|---------|--------------------|--------------------|
| All model names SLV-   | ED115PS | ED215PS<br>ED215TH | ED313ME<br>ED313MJ<br>ED313SG | ED515PS | ED616ME<br>ED616MJ<br>ED616SG | ED815PS<br>ED815TH | ED817PS<br>ED817TH | ED818ME<br>ED818SG | ED915PS<br>ED915TH | ED919MI | EZ111AZ | EZ212AZ | EZ414AZ | EZ715AS<br>EZ715NZ | EZ717AS<br>EZ717NZ |

**VHS VIDEO CASSETTE RECORDER**

# SONY®

## SPECIFICATIONS

|                                                                                                                                |                                                                                                                                                                                                                |                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>System</b>                                                                                                                  | EZ111/EZ212/EZ414/EZ715AS/EZ717AS:                                                                                                                                                                             | <b>General</b>                                                                                                                                                     |
| Color system                                                                                                                   | UHF channels 28 to 69                                                                                                                                                                                          | Power requirements                                                                                                                                                 |
| ED115/ED215/ED313/ED515/ED616/ED815/<br>ED817/ED818/ED915/ED919:<br>PAL, MESECAM, NTSC 3.58,<br>NTSC 4.43 (Others)             | Aerial out<br>75-ohm asymmetrical aerial socket                                                                                                                                                                | 110 - 240 V AC, 50/60 Hz (ED115/ED215/<br>ED313/ED515/ED616/ED815/ED817/<br>ED818/ED915/ED919) (Others)<br>220-240 V AC, 50 Hz (EZ111/EZ212/<br>EZ414/EZ715/EZ717) |
| EZ111/EZ212/EZ414/EZ715/EZ717:<br>PAL, NTSC 4.43 (AS,AZ,NZ)                                                                    |                                                                                                                                                                                                                | Power consumption                                                                                                                                                  |
| TV system                                                                                                                      | <b>Inputs and outputs</b>                                                                                                                                                                                      | 13W (ED115/ED215/ED313/EZ111/<br>EZ212/EZ414)                                                                                                                      |
| ED115/ED215/ED313/ED515/ED616/<br>ED815/ED817/ED818/ED915:<br>B/G, D/K, I                                                      | LINE-1 IN                                                                                                                                                                                                      | 14W (ED515/ED616/ED815/ED817/<br>ED818)                                                                                                                            |
| ED919:<br>B/G, D/K, I, M                                                                                                       | VIDEO IN, phono jack (1)<br>Input signal: 1 Vp-p, 75 ohms, unbalanced,<br>sync negative                                                                                                                        | 16W (ED915/ED919/EZ715/EZ717)                                                                                                                                      |
| EZ111/EZ212/EZ414/EZ715/EZ717:<br>B/G                                                                                          | AUDIO IN (MONO), phono jack (1)<br>(ED115/ED215/ED313/ED515/ED616/<br>EZ111/EZ212/EZ414)                                                                                                                       | Operating temperature                                                                                                                                              |
| Channel coverage                                                                                                               | AUDIO IN, phono jack (2)<br>(ED815/ED817/ED818/ED915/ED919/<br>EZ717)                                                                                                                                          | 5 °C to 40 °C                                                                                                                                                      |
| ED115/ED215/ED313/ED515/<br>ED616/ED815/ED817/ED818/ED915:<br>B/G: VHF E2 to E12/UHF E21 to E69/<br>CATV S01 to S05, S1 to S41 | Input level: 327 mVrms<br>Input impedance: more than 47 kilohms                                                                                                                                                | Storage temperature                                                                                                                                                |
| D/K: VHF R1 to R12/UHF R21 to R69<br>I: VHF SA4 to SA13/UHF B21 to B69/<br>CATV S01 to S05, S1 to S41                          | LINE-2 IN (ED515/ED616/ED818/ED915/<br>ED919/EZ715/EZ717)                                                                                                                                                      | -20 °C to 60 °C                                                                                                                                                    |
| ED919MI:<br>M: VHF A2 to A13/UHF A14 to A69/<br>CATV A-8 to A-1, A to W, W+1 to W+ 84                                          | VIDEO IN, phono jack (1)<br>Input signal: 1Vp-p, 75 ohms, unbalanced,<br>sync negative                                                                                                                         | Dimensions                                                                                                                                                         |
| EZ111/EZ212/EZ414/EZ715AS (COUNTRY<br>is set to AUS),                                                                          | AUDIO IN (MONO), phono jack (2)<br>(ED515/ED616)                                                                                                                                                               | Approx. 430 × 97 × 288 mm (w/h/d)<br>including projecting parts and controls                                                                                       |
| EZ717AS:<br>VHF AS0 to AS12, AS5A, AS9A<br>UHF AS28 to AS69<br>CATV S01 to S05, S1 to S41                                      | AUDIO IN, phono jack (2) (ED818/ED915/<br>ED919/EZ715/EZ717)                                                                                                                                                   | Mass                                                                                                                                                               |
| EZ111/EZ212/EZ414/EZ715NZ (COUNTRY<br>is set to NZ),                                                                           | Input level: 327mVrms<br>Input impedane: more than 47 kilohms                                                                                                                                                  | Approx. 4.1 kg:                                                                                                                                                    |
| EZ717NZ:<br>VHF NZ1 to NZ11<br>UHF E21 to E69<br>CATV S01 to S05, S1 to S41                                                    | LINE-1 OUT                                                                                                                                                                                                     | <b>Supplied accessories</b>                                                                                                                                        |
| RF output signal                                                                                                               | VIDEO OUT, phono jack (1)<br>Output signal: 1 Vp-p, 75 ohms, unbal-<br>anced, sync negative                                                                                                                    | Remote commander (1)<br>R6 (size AA) batteries (2)<br>Aerial cable (1)<br>Plug adaptor (1) (ED313: ME, MJ/ED616: ME,<br>MJ/ED818: ME)                              |
| ED115/ED215/ED313/ED515/ED616/<br>ED815/ED817/ED818/ED915/ED919/<br>EZ715NZ/EZ717NZ:<br>UHF channels 21 to 69                  | AUDIO OUT (MONO), phono jack (1)<br>(ED115/ED215/ED313/EZ111/EZ212)<br>AUDIO OUT (MONO), phono jack (2)<br>(ED515/ED616/EZ414)<br>AUDIO OUT, phono jack (2)<br>(ED815/ED817/ED818/ED915/ED919/<br>EZ715/EZ717) | Design and specifications are subject to change<br>without notice.                                                                                                 |
|                                                                                                                                | Standard output: 327 mVrms<br>Load impedance: 47 kilohms<br>Output impedance: less than 10 kilohms                                                                                                             |                                                                                                                                                                    |

## SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

• Feature Difference

| SLV-<br>FEATURE       | ED115<br>PS   | ED215<br>PS, TH | ED313<br>SG, ME, MJ | ED515<br>PS     | ED616<br>SG, ME, MJ | ED815<br>PS     | ED817<br>TH     | ED818<br>SG, ME | ED915<br>PS, TH | ED919<br>MI     |
|-----------------------|---------------|-----------------|---------------------|-----------------|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| HEAD/CH               | 2/2           | 2/2             | 2/2                 | 2/2             | 4/4                 | 4/4             | 4/6             | 4/6             | 4/6             | 4/6             |
| NTSC (3.58) (REC/PB)  | O/O           | O/O             | O/O                 | O/O             | O/O                 | O/O             | O/O             | O/O             | O/O             | O/O             |
| (4.43) (REC/PB)       | O/O           | O/O             | O/O                 | O/O             | O/O                 | O/O             | O/O             | O/O             | O/O             | O/O             |
| ME-SECAM (REC/PB)     | O/O           | O/O             | O/O                 | O/O             | O/O                 | O/O             | O/O             | O/O             | O/O             | O/O             |
| REC (NTSC) (SP/EP)    | O             | O               | O                   | O               | O                   | O               | O               | O               | O               | O               |
| (PAL) (SP/LP)         | O             | O               | O                   | O               | O                   | O               | O               | O               | O               | O               |
| RCA REAR LINE INPUT   | 2pin<br>(B.Y) | 2pin<br>(B.Y)   | 2pin<br>(B.Y)       | 2pin<br>(B.Y)   | 2pin<br>(B.Y)       | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) |
| RCA REAR LINE OUTPUT  | 2pin<br>(B.Y) | 2pin<br>(B.Y)   | 2pin<br>(B.Y)       | 3pin<br>(B.B.Y) | 3pin<br>(B.B.Y)     | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) |
| RCA FRONT LINE INPUT  | X             | X               | X                   | X               | 3pin<br>(Y.B.B)     | 3pin<br>(Y.B.B) | X               | X               | 3pin<br>(Y.W.R) | 3pin<br>(Y.W.R) |
| MODULATOR SYSTEM      | G/K/I         | G/K/I           | G/K/I               | G/K/I           | G/K/I               | G/K/I           | G/K/I           | G/K/I           | G/K/I           | G/K/I/M         |
| REMOTE COMMANDER RMT- | V311          | V311            | V311                | V311            | V311B               | V311            | V311A           | V311B           | V311A           | V311C           |

| SLV-<br>FEATURE       | EZ111<br>AZ   | EZ212<br>AZ   | EZ414<br>AZ     | EZ715<br>AS, NZ | EZ717<br>AS, NZ |
|-----------------------|---------------|---------------|-----------------|-----------------|-----------------|
| HEAD/CH               | 2/2           | 2/2           | 4/4             | 4/6             | 4/6             |
| NTSC (3.58) (REC/PB)  | X/X           | X/X           | X/X             | X/X             | O/O             |
| (4.43) (REC/PB)       | X/O           | X/O           | X/O             | X/O             | O/O             |
| ME-SECAM (REC/PB)     | X/X           | X/X           | X/X             | X/X             | X/X             |
| REC (NTSC) (SP/EP)    | X             | X             | X               | X               | O               |
| (PAL) (SP/LP)         | O             | O             | O               | O               | O               |
| RCA REAR LINE INPUT   | 2pin<br>(B.Y) | 2pin<br>(B.Y) | 2pin<br>(B.Y)   | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) |
| RCA REAR LINE OUTPUT  | 2pin<br>(B.Y) | 2pin<br>(B.Y) | 3pin<br>(B.B.Y) | 3pin<br>(R.W.Y) | 3pin<br>(R.W.Y) |
| RCA FRONT LINE INPUT  | X             | X             | X               | 3pin<br>(Y.W.R) | 3pin<br>(Y.W.R) |
| MODULATOR SYSTEM      | G             | G             | G               | G               | G               |
| REMOTE COMMANDER RMT- | V311E         | V311D         | V311D           | V311E           | V309            |

## TABLE OF CONTENTS

| <u>Section</u>                                          | <u>Title</u> | <u>Page</u> | <u>Section</u>                                         | <u>Title</u> | <u>Page</u> |
|---------------------------------------------------------|--------------|-------------|--------------------------------------------------------|--------------|-------------|
| Feature Difference .....                                |              | 3           | <b>5. INTERFACE, IC PIN FUNCTION DESCRIPTION</b>       |              |             |
| SERVICE NOTE .....                                      |              | 5           | 5-1. System Control-Video Block Interface              |              |             |
| <b>1. GENERAL</b>                                       |              |             | (MA-402 BOARD IC101) .....                             | 5-1          |             |
| Getting Started .....                                   | 1-1          |             | 5-2. System Control-Servo Peripheral Circuit Interface |              |             |
| Basic Operations .....                                  | 1-8          |             | (MA-402 BOARD IC101) .....                             | 5-1          |             |
| Search Operations .....                                 | 1-12         |             | 5-3. System Control-Mechanism Block Interface          |              |             |
| Additional Operations .....                             | 1-14         |             | (MA-402 BOARD IC101) .....                             | 5-2          |             |
| Additional Information .....                            | 1-16         |             | 5-4. System Control-Audio Block Interface              |              |             |
|                                                         |              |             | (MA-402 BOARD IC101) .....                             | 5-3          |             |
| <b>2. DISASSEMBLY</b>                                   |              |             | 5-5. Servo/System Control,                             |              |             |
| 2-1. Case Front Panel Block Assembly .....              | 2-1          |             | OSD Microprocessor Pin Function                        |              |             |
| 2-2. DM-98, DI-81 Board and FJ-31 Board .....           | 2-1          |             | (MA-402 BOARD IC101) .....                             | 5-4          |             |
| 2-3. Rear Panel .....                                   | 2-2          |             | 5-6. NICAM Processor Pin Function                      |              |             |
| 2-4. MA-402 Board .....                                 | 2-2          |             | (NK-11 BOARD IC1) .....                                | 5-5E         |             |
| 2-5. Mechanism Deck .....                               | 2-3          |             | 5-7. ZWEITON Processor Pin Function                    |              |             |
| 2-6. Internal Views .....                               | 2-4          |             | (GK-12 BOARD IC001) .....                              | 5-5E         |             |
| 2-7. Circuit Boards Location .....                      | 2-5E         |             | <b>6. ERROR CODES</b> .....                            | 6-1E         |             |
| <b>3. BLOCK DIAGRAMS</b>                                |              |             | <b>7. ADJUSTMENTS</b>                                  |              |             |
| 3-1. Overall Block Diagram .....                        | 3-1          |             | 7-1. Mechanical Adjustments .....                      | 7-1          |             |
| 3-2. Video Block Diagram .....                          | 3-3          |             | 7-2. Electrical Adjustments .....                      | 7-1          |             |
| 3-3. Servo/System Control Block Diagram .....           | 3-5          |             | 2-1. Pre-Adjustment Preparations .....                 | 7-1          |             |
| 3-4. Audio Block Diagram .....                          | 3-7          |             | 2-1-1. Instruments to be Used .....                    | 7-1          |             |
| 3-5. Tuner Block Diagram .....                          | 3-9          |             | 2-1-2. Connection .....                                | 7-1          |             |
| 3-6. Mode Control Block Diagram .....                   | 3-11         |             | 2-1-3. Set-up of Adjustment .....                      | 7-1          |             |
| 3-7. Power Block Diagram .....                          | 3-13         |             | 2-1-4. Alingment Tapes .....                           | 7-1          |             |
| <b>4. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS</b>  |              |             | 2-1-5. Specified I/O Level and Impedance .....         | 7-1          |             |
| 4-1. Frame Schematic Diagram .....                      | 4-3          |             | 2-1-6. Adjusting Sequence .....                        | 7-2          |             |
| 4-2. Printed Wiring Boards and Schematic Diagrams ..... | 4-5          |             | 2-2. Power Supply Adjustment .....                     | 7-2          |             |
| • MA-402 Printed Wiring Board .....                     | 4-5          |             | 2-2-1. Power Supply Check .....                        | 7-2          |             |
| • MA-402 (Video, Audio) Schematic Diagram .....         | 4-9          |             | 2-3. Servo System Adjustment .....                     | 7-2          |             |
| • MA-402 (System Control) Schematic Diagram .....       | 4-13         |             | 2-3-1. RF Switching Position Adjustment .....          | 7-2          |             |
| • MA-402 (Servo Control) Schematic Diagram .....        | 4-17         |             | 2-4. Audio System Adjustments .....                    | 7-3          |             |
| • MA-402 (Hi-Fi Audio) Schematic Diagram .....          | 4-19         |             | 2-4-1. Hi-Fi Audio System Adjustment .....             | 7-3          |             |
| • MA-402 (Tuner) Schematic Diagram .....                | 4-21         |             | 1. AF Switching Position Adjustment .....              | 7-3          |             |
| • MA-402 (I/O) Schematic Diagram .....                  | 4-23         |             | 2. Frequency Response Check .....                      | 7-3          |             |
| • MA-402 (Mode Control) Schematic Diagram .....         | 4-25         |             | 3. Overall Level Characteristic and                    |              |             |
| • MA-402 (Power Supply) Schematic Diagram .....         | 4-27         |             | Distortion Factor Check .....                          | 7-4          |             |
| • GK-12 Printed Wiring Board and                        |              |             | 4. Overall S/N Check .....                             | 7-4          |             |
| Schematic Diagram .....                                 | 4-29         |             | 2-4-2. Normal Audio System Adjustment .....            | 7-4          |             |
| • NK-11 Printed Wiring Board and                        |              |             | 1. ACE Head Adjustment .....                           | 7-4          |             |
| Schematic Diagram .....                                 | 4-31         |             | 2. E-E Output Level Check .....                        | 7-4          |             |
| • FJ-31 Printed Wiring Boards and                       |              |             | 3. Frequency Responce Check .....                      | 7-4          |             |
| Schematic Diagrams .....                                | 4-33         |             | 4. Overall Level Characteristic and Distortion         |              |             |
| • DM-98 Printed Wiring Boards and                       |              |             | Factor Check .....                                     | 7-5          |             |
| Schematic Diagrams .....                                | 4-33         |             | 5. Overall S/N Check .....                             | 7-5          |             |
| • DI-81 Printed Wiring Board and                        |              |             | 2-5. Tuner System Adjustment .....                     | 7-5          |             |
| Schematic Diagrams .....                                | 4-35E        |             | 2-5-1. Separation Adjustment .....                     | 7-5          |             |
|                                                         |              |             | 2-6. Parts Arrangement Diagram for Adjustments .....   | 7-6E         |             |
|                                                         |              |             | <b>8. REPAIR PARTS LIST</b>                            |              |             |
|                                                         |              |             | 8-1. Exploded Views .....                              | 8-1          |             |
|                                                         |              |             | 8-1-1. Front Panel and Upper Case Section .....        | 8-1          |             |
|                                                         |              |             | 8-1-2. Chassis Section .....                           | 8-3          |             |
|                                                         |              |             | 8-1-3. Mechanism Deck Section-1 .....                  | 8-5          |             |
|                                                         |              |             | 8-1-4. Mechanism Deck Section-2 .....                  | 8-6          |             |
|                                                         |              |             | 8-1-5. Mechanism Deck Section-3 .....                  | 8-7          |             |
|                                                         |              |             | 8-2. Electrical Parts List .....                       | 8-8          |             |

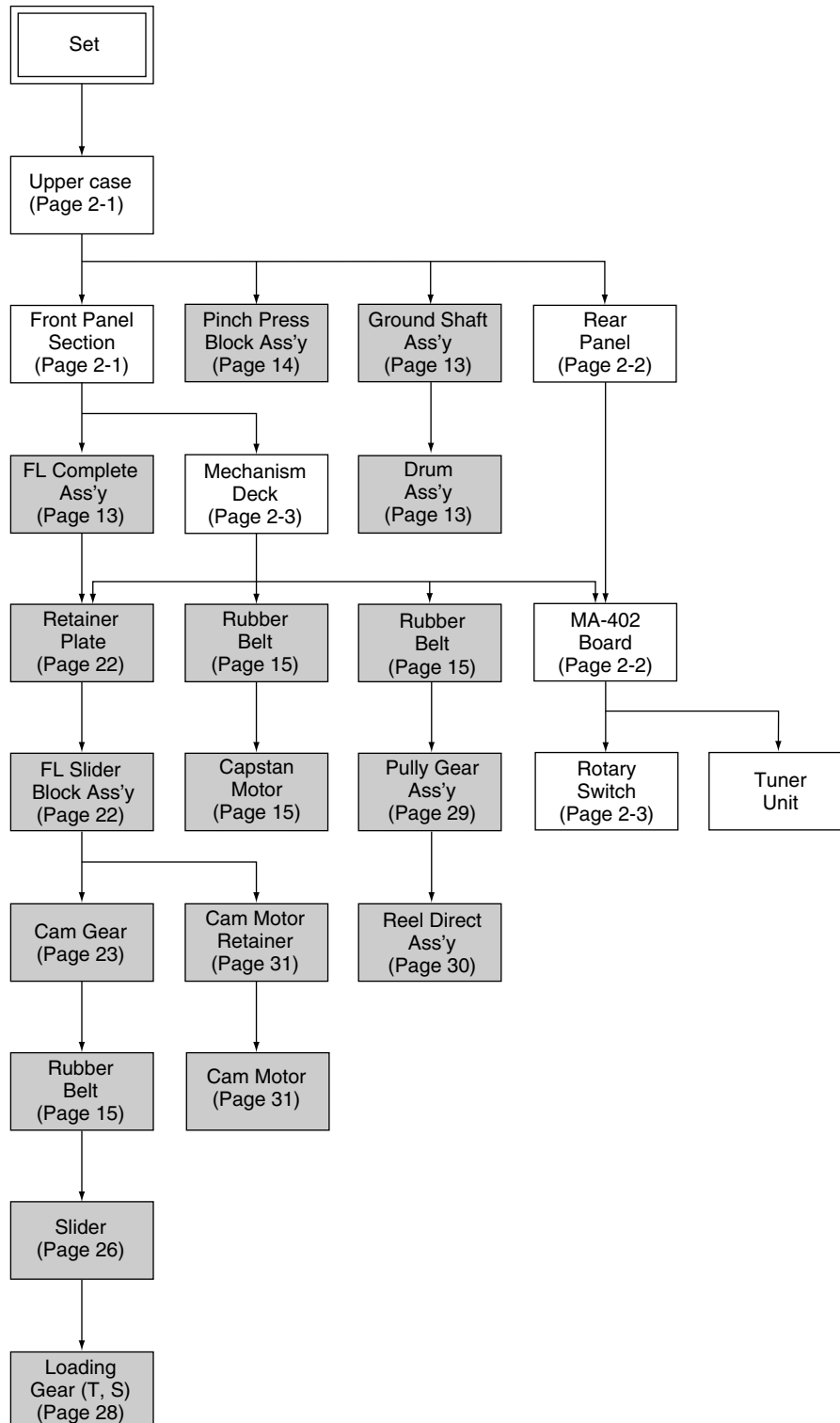
## SERVICE NOTE

### 1. DISASSEMBLY

- This set can be disassembled in the order shown below.

**Note:** Pages in   indicated pages in the SERVICE MANUAL.

Pages in   indicated pages in the VHS MECHANICAL ADJUSTMENT MANUAL VI.



SECTION 1  
GENERAL

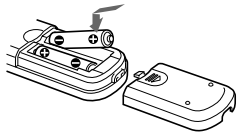
This section is extracted from  
SLV-ED919MI Instruction Manual.  
(3-065-580-11)

Step 2  
Setting up the remote commander

Inserting the batteries

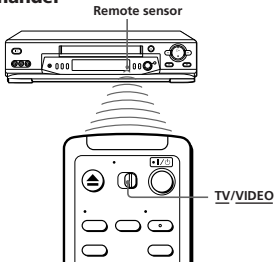
Insert two R6 (size AA) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.

Insert the negative (-) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (•) can be used to operate your Sony TV. If the TV does not have the symbol near the remote sensor, this remote commander will not operate the TV.



| To operate | Set TV/VIDEO to                                 |
|------------|-------------------------------------------------|
| the VCR    | VIDEO and point at the remote sensor on the VCR |
| a Sony TV  | TV and point at the remote sensor on the TV     |

- Notes
- The TV/VIDEO button selects the TV's input source (either aerial in or line in). The button does not control this VCR.
  - With normal use, the batteries should last about three to six months.
  - If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
  - Do not use a new battery with an old one.
  - Do not use different types of batteries.

Getting Started

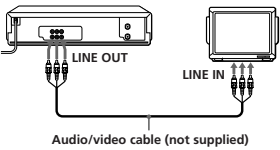
Getting Started | 5

Additional connections

- Note
- To play a tape in stereo, you must use either one of the connections shown below.

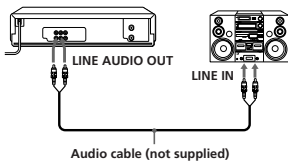
To a TV that has audio/video input jacks

This additional connection improves picture and sound quality. Connect the TV as shown on the right.



To a stereo system

You can improve sound quality by connecting a stereo system as shown on the right.



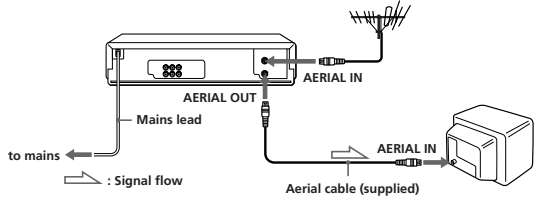
Getting Started

Getting Started | 7

Step 3  
Connecting the VCR

Connect the aerial to your VCR and TV as shown below to watch TV programmes and VCR pictures on your TV. In addition, if your TV has audio/video (A/V) input jacks, we recommend you connect the VCR to your TV using an audio/video cable to get a better picture and sound.

Connecting the aerial

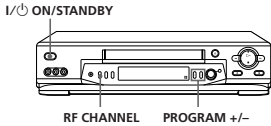


- Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the VCR.
  - Connect AERIAL OUT of the VCR and the aerial input of your TV using the supplied aerial cable.
  - Connect the mains lead to the mains.
- If the 3-pin plug does not fit into the mains outlet, detach the plug by loosening the screw, then use the 2-pin plug inside.

Getting Started

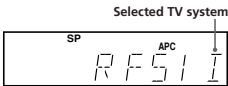
Step 4  
Tuning your TV to the VCR

If you have connected your VCR to the TV using the audio/video cable, skip this step.



- Press I/O ON/STANDBY to turn on the VCR.
- Press RF CHANNEL on the VCR. The factory-preset RF channel flashes in the display window for about three seconds. Press RF CHANNEL again while the RF channel is flashing. The VCR signal is output through this channel to the TV.
- Turn on your TV and select a programme position for the VCR picture. This channel will now be referred to as the video channel. Some TVs reserve a programme position, such as "0", for a VCR. In this case, select the reserved programme position for the VCR picture. Refer to your TV's instruction manual for details.
- Press RF CHANNEL. The TV system indicator appears in the display window. Press PROGRAM +/- to select the correct TV system.

| If your TV colour system and TV system are |     | Select |
|--------------------------------------------|-----|--------|
| PAL                                        | I   | I      |
|                                            | D/K | K      |
|                                            | B/G | G      |
| NTSC                                       | M   | M      |



Getting Started

5

Tune the TV to the same channel as shown in the display window so that the picture on the right appears on the TV screen.

Refer to your TV manual for tuning instructions.

If you select the wrong TV system in step 4, the picture may not appear. Select the appropriate TV system and tune the TV again.

If the picture does not appear clearly, see "To obtain a clear picture from the VCR" below.

SONY VIDEO CASSETTE RECORDER

6



Press RF CHANNEL.

You have now tuned your TV to the VCR. From now on, whenever you want to play a tape, set the TV to the video channel.

#### To obtain a clear picture from the VCR

If the picture does not appear clearly in step 5 above, first go to step 6 to finish this procedure once. Then start from step 2. After pressing RF CHANNEL twice in step 2 to display the RF channel, press PROGRAM +/- so that another RF channel appears. Then tune the TV to the new RF channel until a clear picture appears.

To set another RF channel number on the VCR, select a channel number that does not receive a broadcast signal in your area and is clear of interference from other channels.

If you cannot obtain a clear picture after performing this procedure, we recommend you connect the VCR and TV using the audio/video cable (see "To a TV that has audio/video input jacks" on page 7). If the same symptom persists, consult your nearest Sony dealer.

#### Note

- If you set the wrong TV system, you may have no sound or sound may be distorted (noisy sound).

Getting Started

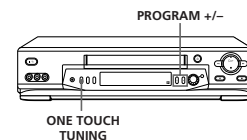
## Step 5

### Presetting channels

First, we recommend that you preset the receivable channels in your area using the One Touch Tuning function or AUTO PRESET in the TUNER PRESET menu. Then, if some channels cannot be preset automatically, set them manually. If there are any unwanted channels among the preset ones, you can disable the channels.

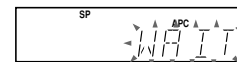
If you live in the area where various TV systems coexist, and have channels that do not match the TV system you selected in automatic presetting, reset the TV system for those channels (see "Resetting the TV system" on page 15). If the channels do not match the TV system, the sound may be distorted or noisy, or the colour TV programme may become black and white, etc.

#### Presetting all receivable channels using the One Touch Tuning function



Press and hold ONE TOUCH TUNING on the VCR for more than three seconds.

The VCR starts presetting the channels.



The WAIT indicator goes off when all receivable channels are preset.

#### To check if the channels are preset correctly

Set the TV to the video channel and press PROGRAM +/- on the VCR. If the TV screen changes to a different programme each time you press PROGRAM +/-, the channels are preset correctly.

If the sound is distorted or noisy, the VCR is set to a TV system different from your area's system. Select the correct TV system and preset channels using the TUNER PRESET menu as shown on the next page.

#### Tip

- To stop the One Touch Tuning function, press ONE TOUCH TUNING or ■ STOP on the VCR during the setting.

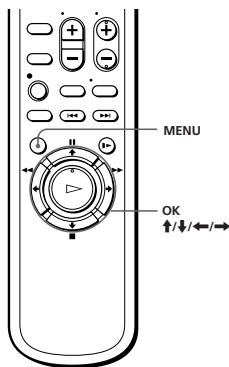
Getting Started | 9

10 | Getting Started

### Presetting all receivable channels automatically

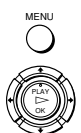
#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



Getting Started

1



Press MENU, then press  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to TUNER PRESET and press OK.

| TUNER PRESET    | PROG 1                    |
|-----------------|---------------------------|
| SYSTEM          | • I • D/K B/G M           |
| NORMAL/CATV     | • NORM CATV               |
| AUTO PRESET     | • ON • OFF                |
| CHANNEL SET     | 1                         |
| AFT FINE TUNING | • ON • OFF                |
| SELECT          | [ $\uparrow/\downarrow$ ] |
| SET             | [ $\blacktriangleright$ ] |

2



Press  $\uparrow/\downarrow/\leftarrow/\rightarrow$  to move the cursor ( $\blacktriangleright$ ) to SYSTEM, then select B/G, D/K, I or M, whichever is applicable in your area. If SYSTEM is set to the wrong position, the sound will be distorted or noisy.

| TUNER PRESET    | PROG 1                    |
|-----------------|---------------------------|
| ▶ SYSTEM        | • I • D/K B/G M           |
| NORMAL/CATV     | • NORM CATV               |
| AUTO PRESET     | • ON • OFF                |
| CHANNEL SET     | 1                         |
| AFT FINE TUNING | • ON • OFF                |
| SELECT          | [ $\uparrow/\downarrow$ ] |
| SET             | [ $\blacktriangleright$ ] |

3



Press  $\uparrow/\downarrow/\leftarrow/\rightarrow$  to move the cursor ( $\blacktriangleright$ ) to NORMAL/CATV, then select NORM. To preset CATV channels, select CATV.

| TUNER PRESET    | PROG 1                    |
|-----------------|---------------------------|
| SYSTEM          | • I • D/K B/G M           |
| ▶ NORMAL/CATV   | • NORM CATV               |
| AUTO PRESET     | • ON • OFF                |
| CHANNEL SET     | 1                         |
| AFT FINE TUNING | • ON • OFF                |
| SELECT          | [ $\uparrow/\downarrow$ ] |
| SET             | [ $\blacktriangleright$ ] |

continued

Getting Started | 11

### Step 5: Presetting channels (continued)

4



Press  $\uparrow/\downarrow$  to move the cursor ( $\blacktriangleright$ ) to AUTO PRESET, then press OK.

All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.

| TUNER PRESET    | PROG 1                    |
|-----------------|---------------------------|
| SYSTEM          | • I • D/K B/G M           |
| NORMAL/CATV     | • NORM CATV               |
| ▶ AUTO PRESET   | • NORM CATV               |
| CHANNEL SET     | 1                         |
| AFT FINE TUNING | • ON • OFF                |
| SELECT          | [ $\uparrow/\downarrow$ ] |
| SET             | [ $\blacktriangleright$ ] |

#### Notes

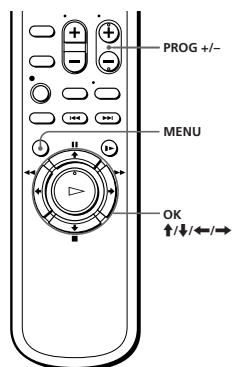
- Picture might disappear for a few seconds during One Touch Tuning and auto presetting functions. This is for tuning procedure, and not a malfunction.
- The channel numbers in the CHANNEL SET column may not be the same as those in your area. This is because this VCR's channel search system is based on the fixed TV system that has the widest channel coverage. If necessary, apply your local channel numbers to the programme positions (see "Presetting channels manually" on page 13).
- If the received channel is on cable TV, "C" appears on the left of the channel in step 4 in most areas. However, this will not be applied in some areas (see pages 17 to 24 for reference).

12 | Getting Started

## Presetting channels manually

### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



Getting Started

- Press MENU, then press / to move the cursor () to TUNER PRESET and press OK.

| TUNER PRESET  | PROG10        |
|---------------|---------------|
| SYSTEM        | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 21            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |
- Press /// to move the cursor () to NORMAL / CATV, then select NORM. To preset CATV channels, select CATV.

| TUNER PRESET  | PROG10        |
|---------------|---------------|
| SYSTEM        | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 21            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |
- Press / to move the cursor () to CHANNEL SET.

| TUNER PRESET  | PROG10        |
|---------------|---------------|
| SYSTEM        | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 21            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |

continued

Getting Started | 13

## Step 5: Presetting channels (continued)

- Press PROG +/- to select the programme position.

**Selected programme position**

| TUNER PRESET  | PROG9         |
|---------------|---------------|
| SYSTEM        | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 21            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |
- Press repeatedly until the channel you want is displayed. Pressing goes back to the previous channels. The channels are scanned in the order shown on page 17 to 24. If you know the number of the channel you want, press the programme number buttons. For example, for channel 5, first press "0" and then press "5".

**Selected programme position**

| TUNER PRESET  | PROG14        |
|---------------|---------------|
| SYSTEM        | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 35            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |
- If the TV sound is distorted or noisy, press /// to move the cursor () to SYSTEM, then select B/G, D/K, I or M, whichever is applicable in your area.

**Selected programme position**

| TUNER PRESET  | PROG14        |
|---------------|---------------|
| ▶ SYSTEM      | • I D/K B/G M |
| NORMAL / CATV | • NORM CATV   |
| AUTO PRESET   |               |
| ▶ CHANNEL SET | 35            |
| AFT           | • ON OFF      |
| FINE TUNING   |               |
| SELECT        | : [▲] [▼]     |
| SET           | : [▶] [◀]     |
- To allocate another channel to another programme position, repeat steps 4 and 5.
- Press OK.

14 | Getting Started

## Disabling unwanted programme positions

After presetting channels, you can disable unused programme positions. The disabled positions will be skipped later when you press the PROG +/- buttons.

- In step 5 on page 14, press programme number button "0" twice to display the number "0" beside CHANNEL SET.
- Press OK.

## Resetting the TV system (only for areas where various TV systems coexist)

If the sound is distorted or noisy, or the colour TV programme becomes black and white, etc., that channel may not be matched to the proper TV system. In this case, try the following steps.

- Press PROG +/- or programme number buttons to select the programme position that has the channel with above described conditions.
- Press MENU, then select TUNER PRESET and press OK.
- Select SYSTEM and select the TV system on which you can obtain the best sound and picture.
- Repeat steps 2 and 3 for other positions you want to reset the TV system to.
- Press OK.

Getting Started

continued

Getting Started | 15

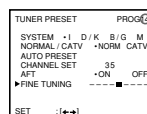
## Step 5: Presetting channels (continued)

### If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture is not clear, you may also use the manual tuning function.

- Press PROG +/- to select the programme number for which you cannot obtain a clear picture.
- Press MENU, then select TUNER PRESET and press OK.
- Select FINE TUNING.

The fine tuning meter appears.



**Selected programme position**

- Press / to get a clearer picture, then press OK. Note that the AFT (Auto Fine Tuning) setting switches to OFF.

### Notes

- The menu disappears automatically if you do not proceed for more than a few minutes.
- The channel numbers in the CHANNEL SET column may not be the same as those in your area. This is because this VCR's channel search system is based on the fixed TV system that has the widest channel coverage. If necessary, apply your local channel numbers to the programme positions (see "Presetting channels manually" on page 13).

16 | Getting Started

Channel numbers in the CHANNEL SET field and the corresponding channels

| TV system                                | B/G                    |           |             |         |           |
|------------------------------------------|------------------------|-----------|-------------|---------|-----------|
| Country                                  | Western Europe         | Australia | New Zealand | Morocco | Indonesia |
| Channel number in the CHANNEL SET column | Corresponding channels |           |             |         |           |
| 1                                        |                        | A50       | 1           |         | 1A        |
| 2                                        | E2                     |           |             |         |           |
| 3                                        | E3                     | 1         | 2           |         | 2A        |
| 4                                        | E4                     | 2         | 3           |         | 3A        |
| 5                                        | E5                     | 6         | 4           | M6      | 4A        |
| 6                                        | E6                     | 7         | 5           |         | 5A        |
| 7                                        | E7                     | 8         | 6           | M7      | 6A        |
| 8                                        | E8                     | 9         | 7           | M8      | 7A        |
| 9                                        | E9                     | 9A        | 8           | M9      | 8A        |
| 10                                       | E10                    | 10        | 9           | M10     | 9A        |
| 11                                       | E11                    | 11        | 10          |         | 10A       |
| 12                                       | E12                    |           | 11          |         | 11A       |
| 13                                       |                        |           |             |         |           |
| 14                                       |                        |           |             |         |           |
| 15                                       |                        | 3         |             |         |           |
| 16                                       |                        | 4         |             |         |           |
| 17                                       |                        |           |             |         |           |
| 18                                       |                        |           |             |         |           |
| 19                                       |                        |           |             |         |           |
| 20                                       |                        |           |             |         |           |
| 21                                       | E21                    |           |             |         |           |
| 22                                       | E22                    |           |             |         |           |
| 23                                       | E23                    |           |             |         |           |
| 24                                       | E24                    |           |             |         |           |
| 25                                       | E25                    |           |             |         |           |
| 26                                       | E26                    |           |             |         |           |
| 27                                       | E27                    |           |             |         |           |
| 28                                       | E28                    | 28        |             |         |           |
| 29                                       | E29                    | 29        |             |         |           |
| 30                                       | E30                    | 30        |             |         |           |
| 31                                       | E31                    | 31, 32    |             |         |           |

Getting Started

continued

Getting Started | 17

## Step 5: Presetting channels (continued)

| TV system                                | B/G                    |           |             |         |           |
|------------------------------------------|------------------------|-----------|-------------|---------|-----------|
| Country                                  | Western Europe         | Australia | New Zealand | Morocco | Indonesia |
| Channel number in the CHANNEL SET column | Corresponding channels |           |             |         |           |
| 32                                       | E32                    | 33        |             |         |           |
| 33                                       | E33                    | 34        |             |         |           |
| 34                                       | E34                    | 35        |             |         |           |
| 35                                       | E35                    | 36        |             |         |           |
| 36                                       | E36                    | 37        |             |         |           |
| 37                                       | E37                    | 38        |             |         |           |
| 38                                       | E38                    | 39, 40    |             |         |           |
| 39                                       | E39                    | 41        |             |         |           |
| 40                                       | E40                    | 42        |             |         |           |
| 41                                       | E41                    | 43        |             |         |           |
| 42                                       | E42                    | 44        |             |         |           |
| 43                                       | E43                    | 45        |             |         |           |
| 44                                       | E44                    | 46        |             |         |           |
| 45                                       | E45                    | 47, 48    |             |         |           |
| 46                                       | E46                    | 49        |             |         |           |
| 47                                       | E47                    | 50        |             |         |           |
| 48                                       | E48                    | 51        |             |         |           |
| 49                                       | E49                    | 52        |             |         |           |
| 50                                       | E50                    | 53        |             |         |           |
| 51                                       | E51                    | 54        |             |         |           |
| 52                                       | E52                    | 55, 56    |             |         |           |
| 53                                       | E53                    | 57        |             |         |           |
| 54                                       | E54                    | 58        |             |         |           |
| 55                                       | E55                    | 59        |             |         |           |
| 56                                       | E56                    | 60        |             |         |           |
| 57                                       | E57                    | 61        |             |         |           |
| 58                                       | E58                    | 62        |             |         |           |
| 59                                       | E59                    | 63, 64    |             |         |           |
| 60                                       | E60                    | 65        |             |         |           |
| 61                                       | E61                    | 66        |             |         |           |
| 62                                       | E62                    | 67        |             |         |           |
| 63                                       | E63                    | 68        |             |         |           |

18 | Getting Started

| TV system                                | B/G                    |           |             |         |           |
|------------------------------------------|------------------------|-----------|-------------|---------|-----------|
| Country                                  | Western Europe         | Australia | New Zealand | Morocco | Indonesia |
| Channel number in the CHANNEL SET column | Corresponding channels |           |             |         |           |
| 64                                       | E64                    | 69        |             |         |           |
| 65                                       | E65                    |           |             |         |           |
| 66                                       | E66                    |           |             |         |           |
| 67                                       | E67                    |           |             |         |           |
| 68                                       | E68                    |           |             |         |           |
| 69                                       | E69                    |           |             |         |           |
| 70                                       |                        |           |             |         |           |
| C1                                       | S1                     | 5         |             |         |           |
| C2                                       | S2                     |           |             |         |           |
| C3                                       | S3                     |           |             |         |           |
| C4                                       | S4                     |           |             |         |           |
| C5                                       | S5                     |           |             |         |           |
| C6                                       | S6                     | 5A        |             |         |           |
| C7                                       | S7                     |           |             |         |           |
| C8                                       | S8                     |           |             |         |           |
| C9                                       | S9                     |           |             | M4      |           |
| C10                                      | S10                    |           |             | M5      |           |
| C11                                      | S11                    |           |             |         |           |
| C12                                      | S12                    |           |             |         |           |
| C13                                      | S13                    |           |             |         |           |
| C14                                      | S14                    |           |             |         |           |
| C15                                      | S15                    |           |             |         |           |
| C16                                      | S16                    |           |             |         |           |
| C17                                      | S17                    |           |             |         |           |
| C18                                      | S18                    |           |             |         |           |
| C19                                      | S19                    |           |             |         |           |
| C20                                      | S20                    |           |             |         |           |
| C21                                      | S21                    |           |             |         |           |
| C22                                      | S22                    |           |             |         |           |
| C23                                      | S23                    |           |             |         |           |
| C24                                      | S24                    |           |             |         |           |
| C25                                      | S25                    |           |             |         |           |
| C26                                      | S26                    |           |             |         |           |

Getting Started

continued

Getting Started | 19

## Step 5: Presetting channels (continued)

| TV system                                | B/G                    |           |             |         |           |
|------------------------------------------|------------------------|-----------|-------------|---------|-----------|
| Country                                  | Western Europe         | Australia | New Zealand | Morocco | Indonesia |
| Channel number in the CHANNEL SET column | Corresponding channels |           |             |         |           |
| C27                                      | S27                    |           |             |         |           |
| C28                                      | S28                    |           |             |         |           |
| C29                                      | S29                    |           |             |         |           |
| C30                                      | S30                    |           |             |         |           |
| C31                                      | S31                    |           |             |         |           |
| C32                                      | S32                    |           |             |         |           |
| C33                                      | S33                    |           |             |         |           |
| C34                                      | S34                    |           |             |         |           |
| C35                                      | S35                    |           |             |         |           |
| C36                                      | S36                    |           |             |         |           |
| C37                                      | S37                    |           |             |         |           |
| C38                                      | S38                    |           |             |         |           |
| C39                                      | S39                    |           |             |         |           |
| C40                                      | S40                    |           |             |         |           |
| C41                                      | S41                    |           |             |         |           |
| C42                                      | S01                    |           |             |         |           |
| C43                                      | S02                    |           |             |         |           |
| C44                                      | S03                    |           |             |         |           |
| C45                                      | S04                    |           |             |         |           |
| C46                                      | S05                    |           |             |         |           |

20 | Getting Started

| TV system                                | D/K                    |       | I            |         |              | M              |          |
|------------------------------------------|------------------------|-------|--------------|---------|--------------|----------------|----------|
| Country                                  | East Europe            | China | UK/Hong Kong | Ireland | South Africa | U.S.A.         | Japan    |
| Channel number in the CHANNEL SET column | Corresponding channels |       |              |         |              |                |          |
| 1                                        |                        |       |              | A       |              |                |          |
| 2                                        | R1                     | 1     |              |         |              |                |          |
| 3                                        |                        | 2     |              | B       |              | 2, C2          |          |
| 4                                        |                        | 3     |              | C       |              | 3              |          |
| 5                                        | R6                     | 7     |              | D       | 4            | 7              | J-5      |
| 6                                        | R7                     | 8     |              | E       | 5            | 8              | J-6      |
| 7                                        |                        |       |              |         |              | 9              | J-7      |
| 8                                        |                        |       |              |         |              |                |          |
| 9                                        |                        |       |              |         |              | 12             | J-10     |
| 10                                       |                        |       |              |         |              | 13             | J-11     |
| 11                                       |                        |       |              |         |              | J              | J-12     |
| 12                                       | R12                    |       |              | J       | 10           | K              | S1       |
| 13                                       | R2                     |       |              |         |              |                |          |
| 14                                       | R3                     | 4     |              |         |              | 5              |          |
| 15                                       | R4                     | 5     |              |         |              |                |          |
| 16                                       | R5                     |       |              |         |              |                |          |
| 17                                       | R8                     | 9     |              | F       | 6            | 10             | J-8      |
| 18                                       | R9                     | 10    |              | G       | 7            | 11             | J-9      |
| 19                                       | R10                    | 11    |              | H       | 8            |                |          |
| 20                                       | R11                    | 12    |              | I       | 9            |                |          |
| 21                                       | R21                    | 13    | B21          |         | 21           | 14, W+29, W+30 | J13      |
| 22                                       | R22                    | 14    | B22          |         | 22           | 15, 16, W+31   | J14, J15 |
| 23                                       | R23                    | 15    | B23          |         | 23           | 17, W+32       | J16      |
| 24                                       | R24                    | 16    | B24          |         | 24           | 18, W+33, W+34 | J17      |
| 25                                       | R25                    | 17    | B25          |         | 25           | 19, 20, W+35   | J18, J19 |
| 26                                       | R26                    | 18    | B26          |         | 26           | 21, W+36       | J20      |
| 27                                       | R27                    | 19    | B27          |         | 27           | 22, W+37, W+38 | J21      |
| 28                                       | R28                    | 20    | B28          |         | 28           | 23, 24, W+39   | J22, J23 |
| 29                                       | R29                    | 21    | B29          |         | 29           | 25, W+40       | J24      |
| 30                                       | R30                    | 22    | B30          |         | 30           | 26, W+41, W+42 | J25      |
| 31                                       | R31                    | 23    | B31          |         | 31           | 27, 28, W+43   | J26, J27 |

continued

Getting Started | 21

#### Step 5: Presetting channels (continued)

| TV system                                | D/K                    |       | I            |         |              | M              |          |
|------------------------------------------|------------------------|-------|--------------|---------|--------------|----------------|----------|
| Country                                  | East Europe            | China | UK/Hong Kong | Ireland | South Africa | U.S.A.         | Japan    |
| Channel number in the CHANNEL SET column | Corresponding channels |       |              |         |              |                |          |
| 32                                       | R32                    | 24    | B32          |         | 32           | 29, W+44       | J28      |
| 33                                       | R33                    |       | B33          |         | 33           | 30, W+45, W+46 | J29      |
| 34                                       | R34                    |       | B34          |         | 34           | 31, 32, W+47   | J30, J31 |
| 35                                       | R35                    |       | B35          |         | 35           | 33, W+48       | J32      |
| 36                                       | R36                    |       | B36          |         | 36           | 34, W+49, W+50 | J33      |
| 37                                       | R37                    |       | B37          |         | 37           | 35, 36, W+51   | J34, J35 |
| 38                                       | R38                    | 25    | B38          |         | 38           | 37, W+52       | J36      |
| 39                                       | R39                    | 26    | B39          |         | 39           | 38, W+53, W+54 | J37      |
| 40                                       | R40                    | 27    | B40          |         | 40           | 39, 40, W+55   | J38, J39 |
| 41                                       | R41                    | 28    | B41          |         | 41           | 41, W+56       | J40      |
| 42                                       | R42                    | 29    | B42          |         | 42           | 42, W+57, W+58 | J41      |
| 43                                       | R43                    | 30    | B43          |         | 43           | 43, 44, W+59   | J42, J43 |
| 44                                       | R44                    | 31    | B44          |         | 44           | 45, W+60       | J44      |
| 45                                       | R45                    | 32    | B45          |         | 45           | 46, W+61, W+62 | J45      |
| 46                                       | R46                    | 33    | B46          |         | 46           | 47, 48, W+63   | J46, J47 |
| 47                                       | R47                    | 34    | B47          |         | 47           | 49, W+64       | J48      |
| 48                                       | R48                    | 35    | B48          |         | 48           | 50, W+65, W+66 | J49      |
| 49                                       | R49                    | 36    | B49          |         | 49           | 51, 52, W+67   | J50, J51 |
| 50                                       | R50                    | 37    | B50          |         | 50           | 53, W+68       | J52      |
| 51                                       | R51                    | 38    | B51          |         | 51           | 54, W+69, W+70 | J53      |
| 52                                       | R52                    | 39    | B52          |         | 52           | 55, 56, W+71   | J54, J55 |
| 53                                       | R53                    | 40    | B53          |         | 53           | 57, W+72       | J56      |
| 54                                       | R54                    | 41    | B54          |         | 54           | 58, W+73, W+74 | J57      |
| 55                                       | R55                    | 42    | B55          |         | 55           | 59, 60, W+75   | J58, J59 |
| 56                                       | R56                    | 43    | B56          |         | 56           | 61, W+76       | J60      |
| 57                                       | R57                    | 44    | B57          |         | 57           | 62, W+77, W+78 | J61      |
| 58                                       | R58                    | 45    | B58          |         | 58           | 63, 64, W+79   | J62      |
| 59                                       | R59                    | 46    | B59          |         | 59           | 65, W+80       |          |
| 60                                       | R60                    | 47    | B60          |         | 60           | 66, W+81, W+82 |          |
| 61                                       |                        | 48    | B61          |         | 61           | 67, 68, W+83   |          |
| 62                                       |                        | 49    | B62          |         | 62           | 69, W+84       |          |

22 | Getting Started

| TV system                                | D/K                    |       | I            |         |              | M        |          |
|------------------------------------------|------------------------|-------|--------------|---------|--------------|----------|----------|
| Country                                  | East Europe            | China | UK/Hong Kong | Ireland | South Africa | U.S.A.   | Japan    |
| Channel number in the CHANNEL SET column | Corresponding channels |       |              |         |              |          |          |
| 63                                       |                        | 50    | B63          |         | 63           | 70       |          |
| 64                                       |                        | 51    | B64          |         | 64           | 71, 72   |          |
| 65                                       |                        | 52    | B65          |         | 65           | 73       |          |
| 66                                       |                        | 53    | B66          |         | 66           | 74       |          |
| 67                                       |                        | 54    | B67          |         | 67           | 75, 76   |          |
| 68                                       |                        | 55    | B68          |         | 68           | 77       |          |
| 69                                       |                        | 56    | B69          |         | 69           | 78       |          |
| 70                                       |                        | 57    |              |         |              | 79       |          |
| C1                                       |                        |       |              |         |              | A-2, A-3 | J-3, M1  |
| C2                                       |                        |       |              |         |              | A-1      | M2       |
| C3                                       |                        |       |              |         |              | A        | M3       |
| C4                                       |                        |       |              |         |              | B        | M4       |
| C5                                       |                        |       |              |         |              | C        | M5       |
| C6                                       |                        |       |              |         |              | D        | M6       |
| C7                                       |                        |       |              |         |              | E, F     | M7, M8   |
| C8                                       |                        |       |              |         |              | G        | M9       |
| C9                                       |                        |       |              |         |              | H        | M10      |
| C10                                      |                        | 6     |              |         |              | I        | J-4      |
| C11                                      |                        |       |              |         | 11           | L, M     | S2       |
| C12                                      |                        |       |              |         | (12)         | N        | S3       |
| C13                                      |                        |       |              |         | 13           | O        | S4, S5   |
| C14                                      |                        |       |              |         |              | P        | S6       |
| C15                                      |                        |       |              |         |              | Q        | S7       |
| C16                                      |                        |       |              |         |              | R        | S8       |
| C17                                      |                        |       |              |         |              | S, T     | S9, S10  |
| C18                                      |                        |       |              |         |              | U        | S11      |
| C19                                      |                        |       |              |         |              | V        | S12      |
| C20                                      |                        |       |              |         |              | W        | S13      |
| C21                                      |                        |       |              |         |              | W+1, W+2 | S14, S15 |
| C22                                      |                        |       |              |         |              | W+3      | S16      |
| C23                                      |                        |       |              |         |              | W+4      | S17      |

continued

Getting Started | 23

#### Step 5: Presetting channels (continued)

| TV system                                | D/K                    |       | I            |         |              | M          |          |
|------------------------------------------|------------------------|-------|--------------|---------|--------------|------------|----------|
| Country                                  | East Europe            | China | UK/Hong Kong | Ireland | South Africa | U.S.A.     | Japan    |
| Channel number in the CHANNEL SET column | Corresponding channels |       |              |         |              |            |          |
| C24                                      |                        |       |              |         |              | W+5, W+6   | S18, S19 |
| C25                                      |                        |       |              |         |              | W+7        | S20      |
| C26                                      |                        |       |              |         |              | W+8        | S21      |
| C27                                      |                        |       |              |         |              | W+9, W+10  | S22, S23 |
| C28                                      |                        |       |              |         |              | W+11       | S24      |
| C29                                      |                        |       |              |         |              | W+12       | S25      |
| C30                                      |                        |       |              |         |              | W+13, W+14 | S26, S27 |
| C31                                      |                        |       |              |         |              | W+15       | S28      |
| C32                                      |                        |       |              |         |              | W+16       | S29      |
| C33                                      |                        |       |              |         |              | W+17, W+18 | S30, S31 |
| C34                                      |                        |       |              |         |              | W+19       | S32      |
| C35                                      |                        |       |              |         |              | W+20       | S33      |
| C36                                      |                        |       |              |         |              | W+21, W+22 | S34, S35 |
| C37                                      |                        |       |              |         |              | W+23       | S36      |
| C38                                      |                        |       |              |         |              | W+24       | S37      |
| C39                                      |                        |       |              |         |              | W+25, W+26 | S38, S39 |
| C40                                      |                        |       |              |         |              | W+27       | S40      |
| C41                                      |                        |       |              |         |              | W+28       | S41      |
| C42                                      |                        |       |              |         |              | 4, 4A      |          |
| C43                                      |                        |       |              |         |              |            |          |
| C44                                      |                        |       |              |         |              | 6          |          |
| C45                                      |                        |       |              |         |              | A-5        | J-1      |
| C46                                      |                        |       |              |         |              | A-4        | J-2      |

#### Notes

- There may be a case that the same area channel may appear repeatedly as the other channel number in the CHANNEL SET column.
- The shadow in the table shows the adjustable RF output channel range.

24 | Getting Started

## Step 6

### Setting up the G-CODE system

The G-CODE system is a feature included in Sony VCRs that simplifies programming the VCR to make timer recordings. To use the G-CODE system, each programme position needs to be matched with its G-CODE guide channel. To get the guide channel numbers, look in the programme guide for your area that features G-CODE numbers.

If you want to record satellite broadcast using the G-CODE system, see page 27.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

#### Setting the guide channels

- Press MENU, then press  $\uparrow/\downarrow$  to move the cursor (►) to SET UP CH AND G-CODE and press OK.  
The preset channels are displayed on the screen.

| SET UP CH AND G-CODE |    |       |     |
|----------------------|----|-------|-----|
| PROG                 | CH | GUIDE | CH  |
| 1                    | 3  | ---   | --- |
| 2                    | 9  | ---   | --- |
| 3                    | 12 | ---   | --- |
| 4                    | 27 | ---   | --- |
| 5                    | 56 | ---   | --- |
| SELECT : [↑↓]        |    |       |     |
| MOVE PROG : [←→]     |    |       |     |
| ERASE PROG : [CLEAR] |    |       |     |

- Press  $\uparrow/\downarrow$  to move the cursor (►) to the row on which you want to set the guide channel.  
To display other pages for programme positions 6 to 50, press  $\uparrow/\downarrow$  repeatedly.

| SET UP CH AND G-CODE |    |       |     |
|----------------------|----|-------|-----|
| PROG                 | CH | GUIDE | CH  |
| 1                    | 3  | ---   | --- |
| 2                    | 9  | ---   | --- |
| 3                    | 12 | ---   | --- |
| 4                    | 27 | ---   | --- |
| 5                    | 56 | ---   | --- |
| SELECT : [↑↓]        |    |       |     |
| MOVE PROG : [←→]     |    |       |     |
| ERASE PROG : [CLEAR] |    |       |     |

continued

Getting Started | 25

## Step 6: Setting up the G-CODE system (continued)

- Press  $\rightarrow$  twice to select the guide channel column.

| SET UP CH AND G-CODE   |    |       |     |
|------------------------|----|-------|-----|
| PROG                   | CH | GUIDE | CH  |
| 1                      | 3  | ---   | --- |
| 2                      | 9  | ---   | --- |
| 3                      | 12 | ---   | --- |
| 4                      | 27 | ---   | --- |
| 5                      | 56 | ---   | --- |
| SELECT GUIDE CH : [←→] |    |       |     |
| CONFIRM : [ENTER]      |    |       |     |

- Press  $\uparrow/\downarrow$  to select the guide channel number assigned in the programme guide.

| SET UP CH AND G-CODE   |    |       |     |
|------------------------|----|-------|-----|
| PROG                   | CH | GUIDE | CH  |
| 1                      | 3  | ---   | --- |
| 2                      | 9  | ---   | --- |
| 3                      | 12 | ---   | --- |
| 4                      | 27 | ---   | --- |
| 5                      | 56 | ---   | --- |
| SELECT GUIDE CH : [↑↓] |    |       |     |
| CONFIRM : [ENTER]      |    |       |     |

- Press  $\leftarrow/\rightarrow$  to confirm the setting.

| SET UP CH AND G-CODE |    |       |     |
|----------------------|----|-------|-----|
| PROG                 | CH | GUIDE | CH  |
| 1                    | 3  | ---   | --- |
| 2                    | 9  | ---   | --- |
| 3                    | 12 | ---   | --- |
| 4                    | 27 | ---   | --- |
| 5                    | 56 | ---   | --- |
| SELECT : [↑↓]        |    |       |     |
| MOVE PROG : [←→]     |    |       |     |
| ERASE PROG : [CLEAR] |    |       |     |

- To set the guide channel of another station, repeat steps 2 to 5.  
If you want to change the programme positions of the stations, proceed to step 2 of "Step 7: Changing/disabling programme positions" on page 28.

- Press OK.

26 | Getting Started

### Setting up the G-CODE system for satellite broadcasts (if applicable)

When your satellite tuner is connected via the AERIAL IN connector, first you have to set the programme position for each satellite channel using the TUNER PRESET menu. Then set the guide channel number for each satellite channel using the SET UP CH AND G-CODE menu.

If your satellite tuner is connected via the LINE-1 IN jacks, you do not have to set programme positions nor guide channel numbers for satellite channels. Skip the following operations.

- Turn on the satellite tuner.
- Press MENU, then select TUNER PRESET and press OK.
- Press PROG +/- to select a programme position you want to use for watching a satellite channel.
- Select CHANNEL SET, then press  $\rightarrow$  to tune the VCR to the satellite tuner.  
The channel number displayed in the CHANNEL SET column is used for receiving all satellite broadcasts from the satellite tuner.
- Press PROG +/- to select another programme position for another satellite channel, and press the programme number buttons to enter the same channel number as the one displayed in step 4.  
Repeat this step for all satellite channels.
- Set the guide channel number for each programme position assigned to the satellite channel by following the procedures on page 25.

#### Notes

- The G-CODE system used in this VCR is for Singapore, Malaysia, Hong Kong, Macau, etc. and cannot be used in areas such as U.S.A., Canada, Japan, Korea, Taiwan and U.K.
- The menu disappears automatically if you do not proceed for more than a few minutes.
- If you inadvertently entered a guide channel number, press  $\uparrow/\downarrow$  repeatedly to reset the "GUIDE CH" column to "----". "----" appears between 1 and 255.
- The VCR does not allow you to enter the guide channel number if the same number has been set.
- If you use a satellite tuner connected via the LINE-1 IN jacks, you do not have to set up the G-CODE guide channels. Just record a satellite programme using the G-CODE number, and the VCR automatically records the programme from the LINE-1 IN jacks.
- When you record a satellite broadcast using the G-CODE number, you need to select the desired channel on the satellite tuner manually.

Getting Started | 27

## Step 7

### Changing/disabling programme positions

After setting the channels and G-CODE guide channels, you can change the programme positions as you like. If any programme positions are unused or unwanted, you can disable them.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.

#### Changing programme positions

e.g. Moving the programme position from 3 to 1.

- Press MENU, then press  $\uparrow/\downarrow$  to move the cursor (►) to SET UP CH AND G-CODE and press OK.

| SET UP CH AND G-CODE |    |       |     |
|----------------------|----|-------|-----|
| PROG                 | CH | GUIDE | CH  |
| 1                    | 3  | ---   | --- |
| 2                    | 9  | ---   | --- |
| 3                    | 12 | ---   | --- |
| 4                    | 27 | ---   | --- |
| 5                    | 56 | ---   | --- |
| SELECT : [↑↓]        |    |       |     |
| MOVE PROG : [←→]     |    |       |     |
| ERASE PROG : [CLEAR] |    |       |     |

- Press  $\uparrow/\downarrow$  to move the cursor (►) to the row on which you want to change the programme position, then press  $\rightarrow$ .  
To display other pages for programme positions 6 to 50, press  $\uparrow/\downarrow$  repeatedly.

| SET UP CH AND G-CODE |    |       |     |
|----------------------|----|-------|-----|
| PROG                 | CH | GUIDE | CH  |
| 1                    | 3  | ---   | --- |
| 2                    | 9  | ---   | --- |
| 3                    | 12 | ---   | --- |
| 4                    | 27 | ---   | --- |
| 5                    | 56 | ---   | --- |
| SELECT : [↑↓]        |    |       |     |
| MOVE PROG : [←→]     |    |       |     |
| ERASE PROG : [CLEAR] |    |       |     |

28 | Getting Started

- 3** Press **↑/↓** until the selected channel and guide channel row moves to the desired programme position.  
The selected channel and guide channel are inserted at the new programme position and the intermediate channels are displaced to fill the gap.
- 4** Press **←** to confirm the setting.
- 5** To change the programme position of another station, repeat steps 2 to 4.
- 6** Press **OK**.

| SET UP CH AND G-CODE |    |       |    |  |
|----------------------|----|-------|----|--|
| PROG                 | CH | GUIDE | CH |  |
| 1                    | 3  | 16    | 2  |  |
| 2                    | 9  | 2     | 3  |  |
| 3                    | 12 | 6     | 4  |  |
| 4                    | 27 | 12    | 5  |  |
| 5                    | 56 | ---   |    |  |
| SELECT : [↑/↓]       |    |       |    |  |
| SET GUIDE CH : [←]   |    |       |    |  |
| CONFIRM : [OK]       |    |       |    |  |

Getting Started

## Step 7: Changing/disabling programme positions (continued)

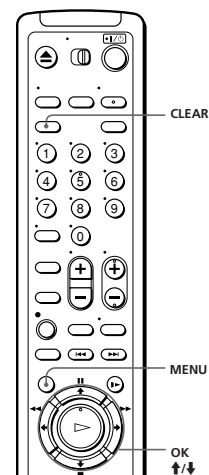
### Disabling unwanted programme positions

#### Note

- Be sure to select the programme position you want to disable correctly. If you disable a programme position by mistake, you need to reset that channel manually.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



- 1** Press **MENU**, then press **↑/↓** to move the cursor (▶) to **SET UP CH AND G-CODE** and press **OK**.
- 2** Press **↑/↓** to move the cursor (▶) to the row on which you want to disable a channel.  
To display other pages for programme positions 6 to 50, press **↑/↓** repeatedly.

| SET UP CH AND G-CODE |    |       |    |  |
|----------------------|----|-------|----|--|
| PROG                 | CH | GUIDE | CH |  |
| 1                    | 3  | 16    | 2  |  |
| 2                    | 9  | 2     | 3  |  |
| 3                    | 12 | 6     | 4  |  |
| 4                    | 27 | 12    | 5  |  |
| 5                    | 56 | ---   |    |  |
| SELECT : [↑/↓]       |    |       |    |  |
| MOVE PROG : [←]      |    |       |    |  |
| ERASE PROG : [CLEAR] |    |       |    |  |

| SET UP CH AND G-CODE |    |       |    |  |
|----------------------|----|-------|----|--|
| PROG                 | CH | GUIDE | CH |  |
| 1                    | 3  | 16    | 2  |  |
| 2                    | 9  | 2     | 3  |  |
| 3                    | 12 | 6     | 4  |  |
| 4                    | 27 | 12    | 5  |  |
| 5                    | 56 | ---   |    |  |
| SELECT : [↑/↓]       |    |       |    |  |
| MOVE PROG : [←]      |    |       |    |  |
| ERASE PROG : [CLEAR] |    |       |    |  |

continued

Getting Started | 29

30 | Getting Started

- 3** Press **CLEAR**.  
The selected row will be cleared as shown on the right.
- 4** Repeat steps 2 and 3 for any other programme positions you want to disable.
- 5** Press **OK**.

| SET UP CH AND G-CODE |    |       |    |  |
|----------------------|----|-------|----|--|
| PROG                 | CH | GUIDE | CH |  |
| 1                    | 3  | 16    | 2  |  |
| 2                    | 9  | 2     | 3  |  |
| 3                    | 0  | ---   | 4  |  |
| 4                    | 27 | 12    | 5  |  |
| 5                    | 56 | ---   |    |  |
| SELECT : [↑/↓]       |    |       |    |  |
| MOVE PROG : [←]      |    |       |    |  |
| ERASE PROG : [CLEAR] |    |       |    |  |

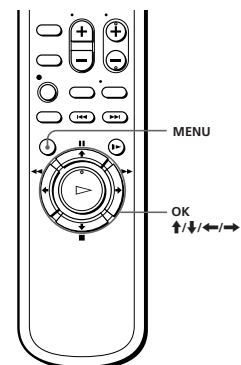
Getting Started

## Step 8 Setting the clock

You must set the time and date on the VCR to be able to use the timer recording features properly.

#### Before you start...

- Turn on the VCR and the TV.
- Set the TV to the video channel.



- 1** Press **MENU**, then press **↑/↓** to move the cursor (▶) to **CLOCK SET** and press **OK**.
- 2** Press **↑/↓** to set the date.  
The day of the week is set automatically.
- 3** Press **→** to select the month and set the month using **↑/↓**.

| CLOCK SET      |          |
|----------------|----------|
| 25/11/2001     | MON 0:00 |
| SELECT : [←/→] |          |
| SET : [↑/↓]    |          |
| END : [OK]     |          |

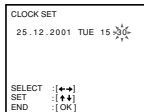
| CLOCK SET      |          |
|----------------|----------|
| 25/11/2001     | THU 0:00 |
| SELECT : [←/→] |          |
| SET : [↑/↓]    |          |
| END : [OK]     |          |

| CLOCK SET      |          |
|----------------|----------|
| 25/11/2001     | TUE 0:00 |
| SELECT : [←/→] |          |
| SET : [↑/↓]    |          |
| END : [OK]     |          |

Getting Started | 31

32 | Getting Started

- 4**  Set the year, hour and minute in sequence, using  to select the item to be set, and  to select the digits.
- 5**  Press OK to start the clock.



Getting Started

**Tip**

- To change the digits when setting, press  to return to the item to be changed, and select the digits using .

**Note**

- The menu disappears automatically if you do not proceed for more than a few minutes.

- 3**  Press  PLAY. When the tape reaches the end, it will rewind automatically.

**Additional tasks**

| To                      | Press                                                                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stop play               |                                                                                         |
| Pause play              |                                                                                         |
| Resume play after pause |  or  |
| Fast-forward the tape   |  during stop                                                                            |
| Rewind the tape         |  during stop                                                                            |
| Eject the tape          |                                                                                         |

**To set the colour system**

If streaks appear during playback, press COLOR SYSTEM on the VCR to conform to the system that the tape was recorded in. (Normally, the colour system is correctly set whenever the tape is inserted.)

| If your tape was recorded in | Press COLOR SYSTEM until the indication below appears in the display window. |
|------------------------------|------------------------------------------------------------------------------|
| PAL                          | PAL                                                                          |
| MESECAM                      | PAL                                                                          |
| NTSC                         | NTSC                                                                         |

**To play an NTSC-recorded tape**

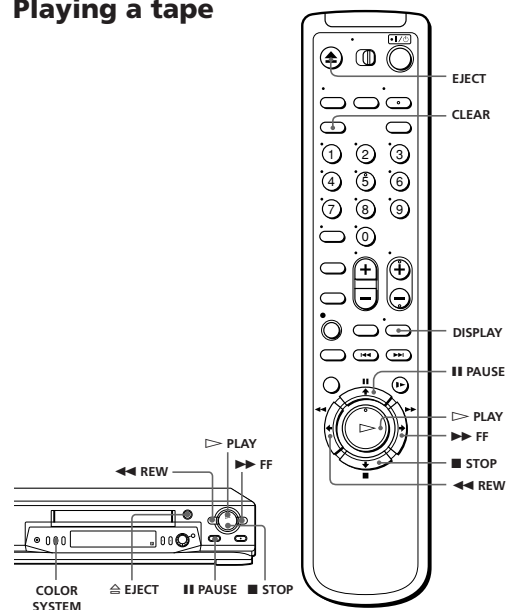
Set NTSC PB in the SET UP MENU according to the colour system of your TV. For details, see page 65.

| If your TV is | Set NTSC PB to |
|---------------|----------------|
| PAL           | ON PAL TV      |
| NTSC 4.43     | 4.43           |
| NTSC 3.58     | 3.58           |

continued

Basic Operations

## Playing a tape



- 1** Turn on your TV and set it to the video channel.

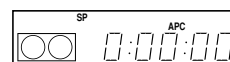
- 2** Insert a tape.  
The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



## Playing a tape (continued)

**To use the time counter**

At the point on the tape that you want to find later, press CLEAR. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.

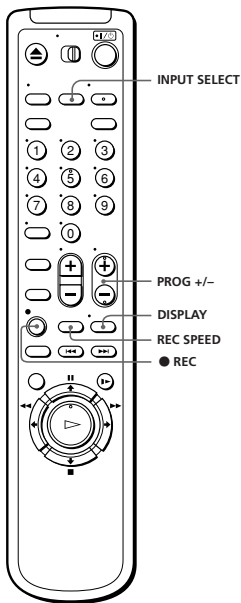


To display the counter on the TV screen, press DISPLAY. Press DISPLAY again and the counter will disappear from the TV screen.

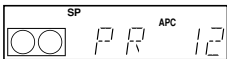
**Notes**

- When you play back a tape recorded in the PAL or MESECAM colour system, streaks may appear even if the colour system setting is set to AUTO. If so, select the colour system PAL or MESECAM in the PAL/MESECAM option of the SET UP MENU (see page 65 for details).
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two colour systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white
  - the picture shakes
  - no picture appears on the TV screen
  - black streaks appear horizontally on the TV screen
  - the colour density increases or decreases.
- Tapes recorded in the LP mode of other NTSC system VCRs can be played back on this VCR, but the picture quality cannot be guaranteed.
- While setting the menu on the TV screen, you cannot use the  PLAY,  PAUSE,  FF,  REW or  STOP buttons. These buttons are used for menu operations.

Recording TV programmes



- 1 Turn on your TV and set it to the video channel.
- 2 Insert a tape with its safety tab in place.
- 3 Press PROG +/- to select the programme position you want to record.



continued

Tips

- To select a programme position, you can use the programme number buttons on the remote commander. For two-digit numbers, press the -- (ten's digit) button followed by the programme number buttons.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks. Press INPUT SELECT or PROG +/- to display "L1" or "L2" in the display window.
- The display appears on the TV screen indicating information about the tape, but the information will not be recorded on the tape.
- If you do not want to watch TV while recording, you can turn off the TV.
- You can have the VCR stop recording automatically after starting at a specified time. For details, see "Setting the recording duration time" on page 58.

Notes

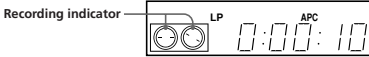
- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.
- The remaining tape length does not appear while playing or recording in the NTSC system.

Recording TV programmes (continued)

- 4 Press REC SPEED to select the tape speed (SP or LP for the PAL colour system, and SP or EP for the NTSC colour system).  
LP (Long Play) provides recording time twice as long as SP (Standard Play). EP (Extended Play) provides recording time three times as long as SP. However, SP produces better picture and audio quality.



- 5 Press REC to start recording. The recording indicator lights up red in the display window.



To stop recording

Press STOP.

To check the remaining tape length

Press DISPLAY. The white bar indicates the approximate length of tape remaining.



To watch another TV programme while recording

- 1 If the TV is connected to the VCR using an audio/video cable, set the TV to TV input. If the TV is connected to the VCR using only the aerial cable, skip this step.
- 2 Select another programme position on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.



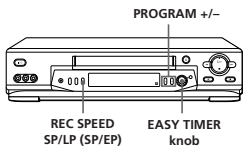
Recording TV programmes using the Easy Timer function

The Easy Timer function allows you to make a timer recording of a programme without turning on your TV. Set the recording timer to record only one programme that will be broadcast within the next 24 hours using the EASY TIMER knob. If the VCR clock has not been set, you can also set the clock before setting the timer recording.

Setting the Easy Timer

Before you start...

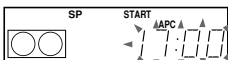
- Insert a tape with its safety tab in place. Make sure the tape is longer than the recording time.



- 1 Push the EASY TIMER knob. The START indicator appears in the display window. If the clock has not been set, "--:--" appears. Go to step 2 in "Setting or changing the Easy Clock" on page 42.

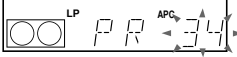


- 2 Set the recording start time by turning the EASY TIMER knob clockwise or counterclockwise to increase or decrease the time by 15 minutes. To increase or decrease the time by one minute, press PROGRAM +/-.



- 3 Push the EASY TIMER knob to confirm the start time setting. The STOP indicator appears.



- 4** **EASY TIMER** Set the recording stop time in the same way as in step 2, then push the EASY TIMER knob. A programme number flashes.
- 
- 5** **EASY TIMER** Turn the EASY TIMER knob clockwise or counterclockwise to select the programme you want to record. To select the tape speed, press REC SPEED. (SP/EP)
- 
- 6** **EASY TIMER** Push the EASY TIMER knob to confirm the setting. The indicator appears in the display window and the VCR stands by for recording.
- 

Basic Operations

continued

Basic Operations 41

- 3** **EASY TIMER** Push the EASY TIMER knob to finish setting the clock. The VCR enters the timer recording setting mode. To continue the Easy Timer setting, go to step 2 in "Setting the Easy Timer" on page 40. To quit the Easy Timer setting mode without changing any settings, push the EASY TIMER knob repeatedly until the indicator appears in the display window.
- 

#### To set the timer and clock setting using the remote commander

You can also use the remote commander to set the Easy Timer and Easy Clock. The operations on the VCR and the remote commander correspond as follows:

| To                                                        | Do this on the VCR                                     | Do this on the remote commander |
|-----------------------------------------------------------|--------------------------------------------------------|---------------------------------|
| Confirm the setting and go to the next setting            | Push the EASY TIMER knob                               | Press <b>[EASY TIMER]</b>       |
| Change the time by 15 minutes (in START/STOP mode)        | Turn the EASY TIMER knob or hold PROGRAM +/- down      | Hold PROG +/- down              |
| Change the time by one minute (in START/STOP mode)        | Press PROGRAM +/-                                      | Press PROG +/-                  |
| Select the programme                                      | Turn the EASY TIMER knob or press PROGRAM INPUT SELECT | Press PROG +/- or               |
| Change the hour/minute by one hour/minute (in CLOCK mode) | Turn the EASY TIMER knob or press PROGRAM +/-          | Press PROG +/-                  |

You can also use the programme number buttons to set the clock, start and stop times, and the programme you want to record. Just press the programme number buttons to enter the hours and minutes. For example:

- To set the clock to "8:20", press 0, 8, **[EASY TIMER]**, 2, 0 and **[EASY TIMER]** in sequence.
- To set the start or stop time to "8:20", press 0, 8, 2, 0 and **[EASY TIMER]** in sequence.

If you make a mistake, re-enter the correct digits before pressing **[EASY TIMER]**.

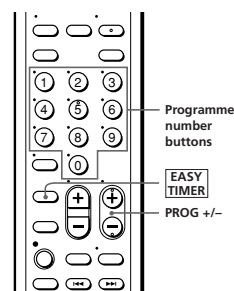
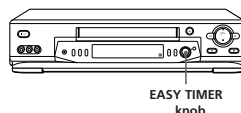
continued

Basic Operations 43

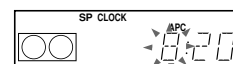
#### Recording TV programmes using the Easy Timer function (continued)

##### Setting or changing the Easy Clock

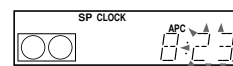
When "--:--" is displayed in the display window, the VCR clock has not been set. You need to set the clock using the Easy Clock function before setting the timer. You can also change the current time using the Easy Clock function.



- 1** **EASY TIMER**
- When "--:--" is displayed in the display window, push the EASY TIMER knob.
  - To change the clock setting, push and hold the EASY TIMER knob on the VCR for more than three seconds. The CLOCK indicator and the current clock setting appear in the display window.



- 2** **EASY TIMER**
- Set the current time using the EASY TIMER knob.
- Turn the EASY TIMER knob clockwise or counterclockwise to enter the current hour.
  - Push the EASY TIMER knob to confirm the hour setting.
  - Turn the EASY TIMER knob to increase or decrease the minutes setting by a minute at a time.



42 Basic Operations

#### Recording TV programmes using the Easy Timer function (continued)

##### To stop recording

To stop the VCR while recording, press **[STOP]**.

##### To check or change the timer setting

Push the EASY TIMER knob repeatedly until the setting you want to check or change flashes. Then re-enter the new setting, if necessary. If you do not want to change any of the settings, push the EASY TIMER knob repeatedly until the indicator appears in the display window.

You can also change the timer setting using the TIMER SET/CHECK menu. For details, see page 59.

##### To cancel the timer setting

To cancel the Easy Timer setting while entering a setting, press CLEAR on the remote commander or press PROGRAM + and - on the VCR at the same time.

##### To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press I/⏻. The indicator turns off and the VCR switches on. Remember to press I/⏻ to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter.
- Display tape information on the TV screen.
- Check the timer settings.
- Watch another TV programme.

##### To watch the recorded programme right after recording with the Easy Timer

The SEARCH MODE indicator starts flashing when the VCR finishes the Easy Timer recording. To watch the recorded programme, push the EASY TIMER knob. The VCR turns on, starts searching, then automatically starts playback from the beginning of the recording. For details, see page 51.

44 Basic Operations

## Tips

- To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press INPUT SELECT or PROG +/- or turn the EASY TIMER knob to display "L1" or "L2" in the display window.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP" in the display window.

## Notes

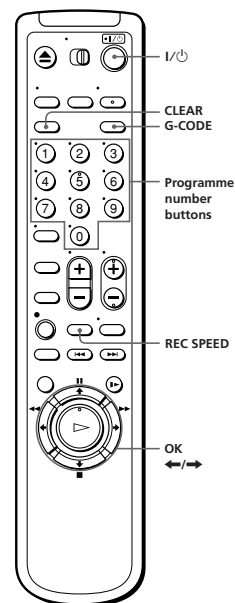
- You cannot set the Easy Timer if eight programmes have already been set.
- You can set the timer for only one programme using the Easy Timer function. If you want to set the timer for other programmes, use the G-CODE system or the TIMER SET/CHECK menu. For details, see pages 46 and 49.
- You cannot set the date using the Easy Timer function. Set the date using the CLOCK SET menu if you want to set the timer with the G-CODE system or the TIMER SET/CHECK menu. For details, see page 32.
- The  indicator flashes in the display window when you complete the setting with no tape inserted.

## Recording TV programmes using the G-CODE system

Just enter the G-CODE number, listed in the TV programme guide, for the programme you want to record. The date, times and programme position of that programme are set automatically. You can preset up to eight programmes at a time.

### Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



1  Press G-CODE.

|                                                   |                 |
|---------------------------------------------------|-----------------|
| G-CODE                                            |                 |
| G-CODE NO.<br>[-----]                             | SP / LP<br>[SP] |
| SET<br>SP / LP : [0-9]<br>REC SPEED : [REC SPEED] |                 |

## Recording TV programmes using the G-CODE system (continued)

### To record satellite broadcasts

If you connect the satellite tuner and the VCR, you can record satellite programmes using the G-CODE number when available.

- Turn on the satellite tuner.
- On the satellite tuner, select the satellite programme for which you wish to make a timer setting.
- Repeat the steps described on pages 46 and 47.
- Keep the satellite tuner turned on until the VCR finishes recording the satellite programme for which you have made a timer setting.

### Tips

- To cancel the procedure, press G-CODE before you press OK.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP".

### Notes

- The G-CODE system used in this VCR is for Singapore, Malaysia, Hong Kong, Macau, etc. and cannot be used in areas such as U.S.A., Canada, Japan, Korea, Taiwan, and U.K.
- The  indicator flashes in the display window when you press I/⏻ with no tape inserted.

2  Press the programme number buttons to enter the G-CODE number for the programme you want to record.

If you make a mistake, press CLEAR and re-enter the correct number.

|                           |                 |
|---------------------------|-----------------|
| G-CODE                    |                 |
| G-CODE NO.<br>[82477691-] | SP / LP<br>[SP] |
| • ONCE DAILY WEEKLY       |                 |
| SELECT                    | [←→]            |
| CONFIRM                   | [OK]            |
| CANCEL                    | [CLEAR]         |

3  Press REC SPEED to select SP or LP.

|                           |                 |
|---------------------------|-----------------|
| G-CODE                    |                 |
| G-CODE NO.<br>[82477691-] | SP / LP<br>[LP] |
| • ONCE DAILY WEEKLY       |                 |
| SELECT                    | [←→]            |
| CONFIRM                   | [OK]            |
| CANCEL                    | [CLEAR]         |

4  Select ONCE, DAILY or WEEKLY by using  / , then press OK:

| To record                 | Select |
|---------------------------|--------|
| Only once                 | ONCE   |
| Everyday Monday to Friday | DAILY  |
| Once a week               | WEEKLY |

|                           |                 |
|---------------------------|-----------------|
| G-CODE                    |                 |
| G-CODE NO.<br>[82477691-] | SP / LP<br>[LP] |
| RECORDING TIME            |                 |
| DATE                      | START STOP PROG |
| 25:12TUE                  | 19:00 20:00 607 |
| CANCEL : [CLEAR]          |                 |

The date, start and stop times, programme position, and tape speed appear on the TV screen.

If the information is not correct, press CLEAR to cancel the setting.

5 To enter another setting, repeat steps 1 to 4.

6  Press I/⏻ to turn off the VCR. The  indicator appears in the display window and the VCR stands by for recording.

### To stop recording

To stop the VCR while recording, press  STOP.

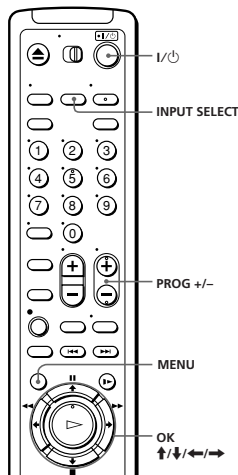
continued

## Setting the timer manually

You can preset up to eight programmes at a time.

### Before you start...

- Check that the VCR clock is set to the correct time.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
- Turn on your TV and set it to the video channel.



- Press MENU and select TIMER SET/CHECK, then press OK.
- Set the date, start and stop times, programme position, and tape speed:

  - 1 Press → to select each item in turn.
  - 2 Press ↑/↓ to set each item.

To correct a setting, press ← to return to that setting and reset it.

continued

Basic Operations 49

## Setting the timer manually (continued)

To record the same programme every day or the same day every week, press ↓ while the date is flashing. For details, see "Daily/weekly recording" below.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks; press INPUT SELECT or PROG +/- to display "L1" or "L2" in the "PROG" position.

- Press → to confirm the setting.

The cursor (▶) appears at the beginning of the line. To enter another setting, move the cursor to the next line and repeat step 2.
- Press OK.
- Press I/ψ to turn off the VCR.

The Ⓢ indicator appears in the display window and the VCR stands by for recording.

To record from other equipment, leave the connected equipment switched on.

### To stop recording

To stop the VCR while recording, press ■ STOP.

### Daily/weekly recording

In step 2 above, press ↓ to select the recording pattern. Each time you press ↓, the indication changes as shown below. Press ↑ to change the indication in reverse order.

the current date → SUN-SAT (Sunday to Saturday) → MON-SAT (Monday to Saturday) → MON-FRI (Monday to Friday) → EVERY SAT .... → EVERY MON → EVERY SUN → 1 month later → (dates count down) → the current date

### Tips

- To set the programme position, you can also use the PROG +/- or programme number buttons.
- To set the tape speed, you can also use the REC SPEED button.
- To record NTSC signals, set the tape speed to SP or EP. To record in the EP mode, set the tape speed to "LP".

### Note

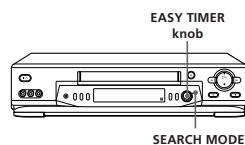
- The Ⓢ indicator flashes in the display window when you press I/ψ with no tape inserted.

50 Basic Operations

## Search Operations

## Searching for the beginning of an Easy Timer recorded programme

If you record a programme using the Easy Timer function, you can easily find the beginning of the recording with the SEARCH MODE function. The SEARCH MODE indicator flashes when the VCR finishes making an Easy Timer recording.



Push the EASY TIMER knob.

The VCR turns on, rewinds to the beginning of the recorded programme and starts playback automatically. The SEARCH MODE indicator turns off.

### Tip

- You can start the SEARCH MODE function after the flashing of the SEARCH MODE indicator has been stopped. The flashing stops when you turn on the VCR and press the SEARCH MODE button (Do not press any button at this point, otherwise this SEARCH MODE function will be cancelled). To start the SEARCH MODE function, press the SEARCH MODE button repeatedly until the SEARCH MODE indicator flashes. Push the EASY TIMER knob. The VCR rewinds and starts playback automatically.

If you continue to press the SEARCH MODE button while the SEARCH MODE indicator is flashing, you can enter other search operations (For details, see the following pages). Each press of the SEARCH MODE button changes the search operations as follows:

→ REMAIN → BLANK → INDEX → TIME → Off

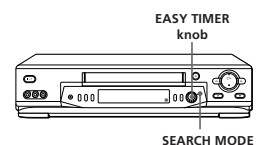
### Note

- This SEARCH MODE function will be cancelled (the SEARCH MODE indicator turns off) if:
  - The VCR starts recording other programmes.
  - You press the ▷ PLAY, ►► FF, ◀◀ REW or Ⓢ EJECT button while the VCR is on.

Search Operations 51

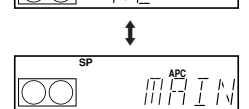
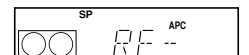
## Searching for the current position on a tape

This feature enables you to find the current position on a tape as well as the remaining time of the tape.



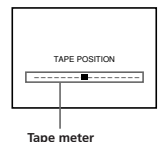
- Press SEARCH MODE repeatedly until the REMAIN indicator appears in the display window as shown on the right.

The SEARCH MODE indicator lights up.



- Push the EASY TIMER knob to display the tape meter on the TV screen.

The SEARCH MODE indicator turns off. A cursor (■) indicates the current position on the tape.



"REMAIN" and the remaining time of the tape appear in the display window in the following order:

→ RE- → MAIN → 0:15 (remaining time of the tape)

### To stop the Search function

Press ■ STOP.

### Notes

- To display the remaining time correctly, you may have to select the TAPE LENGTH in the SET UP MENU according to the type of the tape that you are using. For details, see page 65.
- In step 2, the VCR automatically rewinds and fast-forwards the tape only if you press the SEARCH MODE button right after you insert a tape. This is so that the VCR can measure the current position on the tape.
- You cannot use this function during any recording mode.

52 Search Operations

## Searching using the Blank Search function

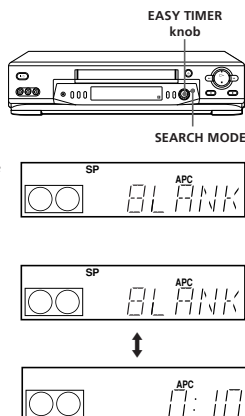
This feature enables you to find a blank section on your tape.

- 1 Press SEARCH MODE repeatedly until the BLANK indicator appears in the display window.

The SEARCH MODE indicator lights up.

- 2 Push the EASY TIMER knob on the VCR. The SEARCH MODE indicator turns off. The VCR fast-forwards to the end of the tape. Then, the VCR rewinds the tape to the last recorded programme. After a few seconds, the VCR starts playback and stops at the beginning of the blank section.

"BLANK" and the remaining time of the blank section appear alternately in the display window for about one minute.

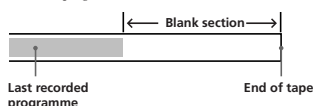


### To stop searching

To stop the VCR while searching for a blank section, press ■ STOP.

#### Notes

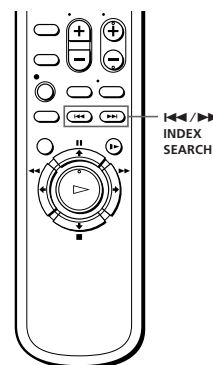
- To display the remaining time correctly, you may have to select the TAPE LENGTH in the SET UP MENU according to the type of the tape that you are using. For details, see page 65.
- In step 2, "FULL" will appear in the display window for about one minute, if:
  - there is no blank section available on the tape.
  - the remaining time of a blank section is less than one minute.
- The VCR can only detect the blank section between the end of the tape and the end of the last recorded programme.



Search Operations | 53

## Searching using the index function

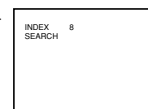
The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 99 index signals ahead of or behind the current position. You can either use the INDEX SEARCH buttons on the remote commander or the SEARCH MODE button and EASY TIMER knob on the VCR.



### Using the INDEX SEARCH buttons on the remote commander

- 1 Insert an indexed tape into the VCR.
- 2 Press ◀/▶ INDEX SEARCH repeatedly to specify how many index signals ahead or behind you want to search:
  - To search ahead, press ▶▶ INDEX SEARCH.
  - To search backwards, press ◀◀ INDEX SEARCH.

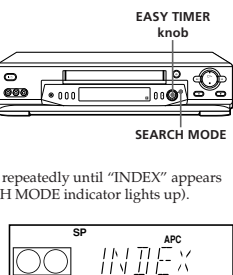
The VCR starts searching and the index number on the TV screen counts down to zero. Playback starts from the point about five seconds ahead of the specified index mark.



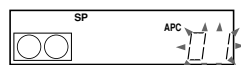
54 | Search Operations

## Using the SEARCH MODE button and EASY TIMER knob on the VCR

- 1 Press SEARCH MODE on the VCR repeatedly until "INDEX" appears in the display window (the SEARCH MODE indicator lights up).



- 2 Turn the EASY TIMER knob to specify how many index signals ahead or behind you want to search:
  - To search ahead, turn the EASY TIMER knob clockwise.
  - To search backwards, turn the EASY TIMER knob counterclockwise.



- 3 Push the EASY TIMER knob. The VCR starts searching. Playback starts (the SEARCH MODE indicator turns off) from the point about five seconds ahead of the specified index mark.

### To stop searching

Press ■ STOP.

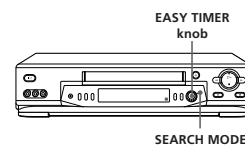
#### Note

- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

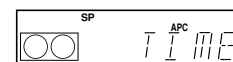
Search Operations | 55

## Searching using the Time Search function

You can easily find a specific point on a tape by using the Time Search function. For example, you can find a recorded section 15 minutes ahead of the current position of a tape by using the Time Search function.



- 1 Press SEARCH MODE repeatedly until "TIME" appears in the display window (the SEARCH MODE indicator lights up).



- 2 Turn the EASY TIMER knob clockwise or counterclockwise to set the length of time you want the VCR to fast-forward or rewind the tape. Each turn on the knob increases or decreases the duration by 15 minutes.

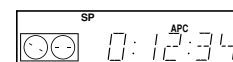
For example, if you want to watch a recorded section 15 minutes ahead of the current position, turn the EASY TIMER knob once clockwise.

To change the time by one minute, press PROGRAM +/-.



- 3 Push the EASY TIMER knob.

The VCR starts searching and the tape counter starts counting until it reaches the specified point.



The VCR starts playback automatically when the tape counter reaches the specified point (the SEARCH MODE indicator turns off).

### To stop searching

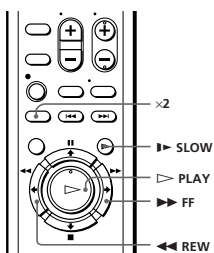
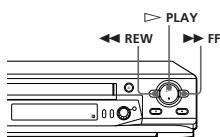
Press ■ STOP.

#### Tip

- The VCR can search up to three hours ahead of or behind the current position of a tape.

56 | Search Operations

## Playing/searching at various speeds



| Playback options                               | Operation                                                                                                                                                                                                                    |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View the picture during fast-forward or rewind | During fast-forward, hold down ►► FF. During rewind, hold down ◄◄ REW.                                                                                                                                                       |
| Play at high speed                             | <ul style="list-style-type: none"> <li>During playback, press ►► FF or ◄◄ REW on the remote commander.</li> <li>During playback, hold down ►► FF or ◄◄ REW. When you release the button, normal playback resumes.</li> </ul> |
| Play at twice the normal speed                 | During playback or pause, press x2.                                                                                                                                                                                          |
| Play in slow motion                            | During playback or pause, press ► SLOW.                                                                                                                                                                                      |
| Play frame by frame                            | During pause, press ►► FF or ◄◄ REW on the remote commander. Hold down the button to play one frame each second.                                                                                                             |
| Rewind and start play                          | While the tape is stopped, hold down ◄◄ REW on the VCR, and press ►► PLAY on the VCR.                                                                                                                                        |

### To resume normal playback

Press ►► PLAY.

### Tips

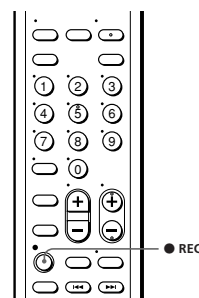
- Adjust the picture using TRACKING +/- on the VCR if:
  - streaks appear while playing in slow motion.
  - the picture shakes during pause.
- To set tracking to the centre position, press both buttons (+/-) at the same time.
- If noise appears during pause or frame-by-frame playback, first switch to the slow motion playback, then adjust the picture using TRACKING +/- on the VCR.

### Notes

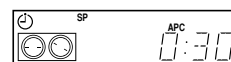
- The playback sound is muted during these operations.
- In LP or EP mode, noise may appear or there may be no colour.
- The picture may show noise when playing at high speed in reverse.
- On-screen symbols may shake while playing or searching at various speeds.

## Setting the recording duration time

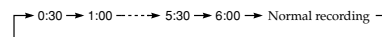
After you have started recording in the normal way, you can have the VCR stop recording automatically after a specified duration.



- While recording, press ● REC. The ⊕ indicator appears in the display window.



- Press ● REC repeatedly to set the duration. Each press advances the time in increments of 30 minutes.



The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

### To extend the duration

Press ● REC repeatedly to set to the new duration.

### To cancel the duration

Press ● REC repeatedly until the ⊕ indicator turns off and the VCR returns to normal recording mode.

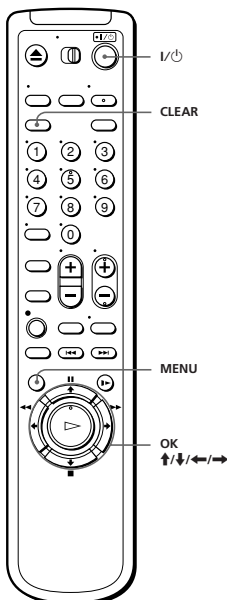
### To stop recording

To stop the VCR while recording, press ■ STOP.

## Checking/ changing/ cancelling timer settings

### Before you start...

- Turn on your TV and set it to the video channel.



- Press I/⏻ to turn on the VCR.
- Press MENU, then select TIMER SET/CHECK and press OK:

- If you want to change or cancel a setting, go on to the next step.
- If you do not need to change or cancel the settings, press OK, then turn off the VCR to return to recording standby.

| TIMER SET / CHECK |       | 25.12TUE |       |
|-------------------|-------|----------|-------|
| DATE              | START | STOP     | PROG  |
| ► 6.1SUN          | 7:00  | 8:00     | 6 SP  |
| 8.1TUE            | 21:00 | 0:00     | 50 LP |
| MON-SAT           | 0:12  | 13:00    | 27 LP |
| EVERY SUN         | 23:00 | 0:00     | L2 SP |
| ---               | ---   | ---      | ---   |
| ---               | ---   | ---      | ---   |
| ---               | ---   | ---      | ---   |
| ---               | ---   | ---      | ---   |

continued

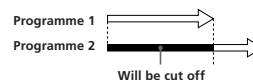
## Checking/ changing/ cancelling timer settings (continued)

- Press ↑/↓ to select the setting you want to change or cancel:
  - To change the setting, press ◀/▶ to select the item you want to change, and press ↑/↓ to reset it. Then, press ► repeatedly until the cursor (►) appears at the beginning of the line.
  - To cancel the setting, press CLEAR.
- Press OK.
 

If any timer settings remain, turn off the VCR to return to recording standby.

### When the timer settings overlap

The programme that starts first has priority and the second programme starts recording only after the first programme has finished. If the programmes start at the same time, the programme listed first in the menu has priority.



Recording stereo and bilingual programmes

**In the ZWEITON (German stereo) system**

This VCR automatically receives and records stereo and bilingual programmes based on the ZWEITON system. When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

**To select bilingual sound while recording**

Press AUDIO MONITOR to select the sound you want.

| To listen to | On-screen display | Display window |
|--------------|-------------------|----------------|
| Main         | MAIN              | STEREO         |
| Sub          | SUB               | STEREO         |
| Main and sub | MAIN/SUB          | STEREO         |

**In the NICAM system**

This VCR receives and records stereo and bilingual programmes based on the NICAM system (the NICAM indicator appears). When a stereo or bilingual programme is received, the STEREO indicator appears in the display window.

To record a NICAM programme, HI-FI AUDIO in the SET UP MENU should be set to NICAM (initial setting). To check the menu setting, see page 65.

**To select the sound while recording**

Press AUDIO MONITOR to select the sound you want.

**Stereo programme**

| To listen to    | On-screen display | Display window |
|-----------------|-------------------|----------------|
| Stereo          | STEREO            | STEREO         |
| Standard sound* | No indicator      | No indicator   |

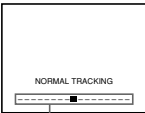
\* Usually the mixed sound of left and right channels (monaural)

Adjusting the picture

**Adjusting the tracking**

Although the VCR automatically adjusts the tracking when playing a tape (the  indicator flashes in the display window, then turns off), distortion may occur if the tape was recorded in poor condition. If so, manually adjust the tracking.

Press the TRACKING +/- buttons on the VCR to display the tracking meter. The distortion should disappear as you press one of the two buttons (the  indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



Tracking meter

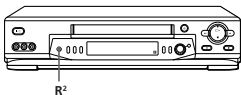
**About the R<sup>2</sup> (Reality Regenerator) function**

The R<sup>2</sup> function automatically adjusts the picture to the most suitable quality during playback.

When playback starts, the R<sup>2</sup> function activates and the R<sup>2</sup> button lights up.

Each press of the button changes the effect and indication in the display window as follows:

REAL (status of playback started) → SOFT → DYNA (dynamic)



R<sup>2</sup>

Recording stereo and bilingual programmes (continued)

**Bilingual programme**

| To listen to    | On-screen display | Display window |
|-----------------|-------------------|----------------|
| Main            | MAIN              | STEREO         |
| Sub             | SUB               | STEREO         |
| Main and sub    | MAIN/SUB          | STEREO         |
| Standard sound* | No indicator      | No indicator   |

\* Usually the main sound (monaural)

**Selecting the sound during playback**

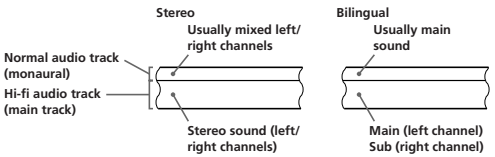
Press AUDIO MONITOR to select the sound you want.

| To listen to                                  | On-screen display | Display window |
|-----------------------------------------------|-------------------|----------------|
| Stereo/main and sub (left and right channels) | STEREO            | STEREO         |
| Left channel/main                             | L CH              | STEREO         |
| Right channel/sub                             | R CH              | STEREO         |
| Standard sound*                               | No indicator      | No indicator   |

\* The mixed sound of left and right channels (monaural)

**How sound is recorded on a video tape**

The VCR records sounds onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



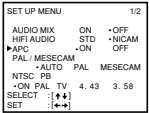
**Notes**

- To play a tape in stereo, you must use the AUDIO OUT connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- If the AUDIO MONITOR button does not function, check that AUDIO MIX in the SET UP MENU is set to OFF.
- If HI-FI AUDIO is set to STD, the standard sound will be recorded on both the hi-fi and normal audio tracks. Pressing AUDIO MONITOR will not change the sound.

Adjusting the picture (continued)

**About the Adaptive Picture Control (APC) function**

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to ON in the SET UP MENU (The APC indicator lights up in the display window).



**APC playback**

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

**APC recording**

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

**To deactivate the APC function**

Press MENU and select SET UP MENU, then set APC to OFF. The APC indicator in the display window turns off.

**Tip**

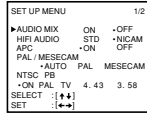
- To set the tracking to the centre position, press the TRACKING + and - buttons at the same time.

**Note**

- There is a delay of a few seconds before the VCR actually starts recording while the VCR analyses the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press  REC to have the VCR analyse the tape (the APC indicator flashes rapidly). After the APC indicator stops flashing, press  PAUSE to start recording immediately. If you press  PAUSE before the APC indicator stops flashing, the APC function is cancelled.

## Changing menu options

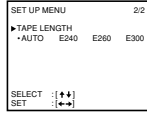
- 1 Press MENU, then select SET UP MENU.



- 2 Press  $\uparrow/\downarrow$  to select the option to change, then press  $\leftarrow/\rightarrow$  to change the setting.

The SET UP MENU has 2 pages. To select page 2, press  $\downarrow$  repeatedly until page 2 appears. To select page 1 press  $\uparrow$  repeatedly until page 1 appears.

- 3 Press OK to return to the original screen.



### Menu choices

Initial settings are indicated in bold print.

| Menu option | Set this option to                                                                                                                                                                                                                    |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AUDIO MIX   | ON to listen to the hi-fi and normal audio tracks at the same time. The AUDIO MONITOR button will not function.<br><b>OFF</b> to listen to hi-fi and normal audio tracks separately. Select the sound using the AUDIO MONITOR button. |
| HIFI AUDIO  | STD to record standard sound on the hi-fi audio track.<br><b>NICAM</b> to record NICAM broadcasts on the hi-fi audio track. For details, see page 61.                                                                                 |
| APC         | <b>ON</b> to switch on the APC (Adaptive Picture Control) function and improve picture quality. OFF to switch off APC.                                                                                                                |
| PAL/MESECAM | <b>AUTO</b> to have the VCR automatically select the colour system for recording and playback. If the picture has no colour or unusual colours, set to PAL or MESECAM according to your local colour system.                          |
| NTSC PB     | <b>ON PAL TV</b> to play back an NTSC-recorded tape on a PAL TV. 4.43 or 3.58 according to the colour system of your NTSC TV. For details, see page 35.                                                                               |
| TAPE LENGTH | <b>AUTO</b> to have the VCR automatically select the tape length. For E240, E260 or E300 tapes, set it according to the tape type that you are using to display the remaining time correctly.                                         |

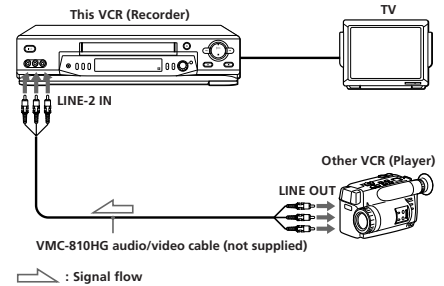
#### Note

- You may not be able to display the remaining time correctly for an NTSC tape using the TAPE LENGTH menu.

Additional Operations | 65

## Connecting to a VCR or stereo system

### How to connect to record on this VCR



### How to connect to a stereo system

Connect LINE-2 IN AUDIO on this VCR to the audio output jacks on the stereo system, using the RK-C510HG audio cable (not supplied).

#### Tips

- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.
- You can also use the LINE-1 IN jacks instead. If the other VCR is a monaural type, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied).

#### Notes

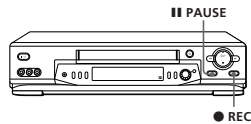
- Make sure you connect the plugs to the jacks of the same colour.
- If you connect this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.

66 | Additional Operations

## Operation (when recording on this VCR)

### Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or PROG +/- to display "L1" or "L2" in the display window.
- Press REC SPEED to select the tape speed (SP or LP for the PAL system, and SP or EP for the NTSC system).



- 1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
- 2 Insert a tape with its safety tab in place into this (recording) VCR. Search for the point to start recording and press  $\mathbf{II}$  PAUSE.
- 3 Press  $\bullet$  REC on this VCR and set it to recording pause.
- 4 To start editing, press the  $\mathbf{II}$  PAUSE buttons on both VCRs at the same time.

### To stop editing

Press the  $\blacksquare$  STOP buttons on both VCRs.

#### Tips

- To edit more precisely, press the  $\mathbf{II}$  PAUSE buttons on the VCRs to release pause.
- To cut out unwanted scenes while editing, press  $\mathbf{II}$  PAUSE on this VCR when an unwanted scene begins. When it ends, press  $\mathbf{II}$  PAUSE again to resume recording.

#### Note

- If you start recording following the procedure above, the VCR will not start recording with the APC function. To record a tape with the APC function, press  $\bullet$  REC again during recording pause in step 3 so that the VCR analyses the tape. Then when you start recording in step 4, press  $\mathbf{II}$  PAUSE after the APC indicator stops flashing. If you press  $\mathbf{II}$  PAUSE before the APC indicator stops flashing, the APC function is cancelled.

Additional Operations | 67

## Sapphire tape cleaner

The unit incorporates a sapphire tape cleaner which cleans a video tape when it is loaded. This cleaner can prevent the video heads from contamination by removing dust or mold from a tape with its sapphire edge.

### Head Condition Sensor

The Head Condition Sensor checks the condition of the video heads. If the heads are dirty, a message will instruct you to insert a video head cleaning cassette.

The VCR may temporarily switch to a different head and resume playback. To switch the heads, press  $\triangleright$  PLAY while the "PUSH [PLAY] TO RESUME TEMPORARILY" message appears on the screen. Although playback will resume, the sound will be monaural. You may have to manually adjust the tracking to get a better picture (see "Adjusting the picture" on page 63). When playback is finished, be sure to clean the heads with a video head cleaning cassette.

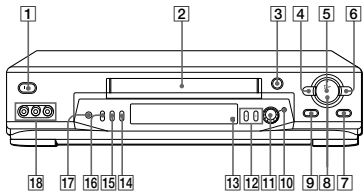
Be sure to use the Sony T-25CLD, T-25CLW or E-25CLDR video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service charge will be required).

Additional Information | 71

Index to parts and controls

Refer to the pages indicated in parentheses ( ) for details.

Front panel



- 1 I/⏻ ON/STANDBY switch (8)

2 Tape compartment

3 EJECT button (35)

4 ◀◀ REW (rewind) button (35, 57)

5 ▷ PLAY button (35)

6 ▶▶ FF (fast-forward) button (35, 57)

7 ● REC (record) button (38)

8 ■ STOP button (35)

9 || PAUSE button (35)

10 SEARCH MODE button/indicator (51, 52, 53, 55, 56)
- 11 EASY TIMER knob (40, 51, 52, 53, 55, 56)

12 PROGRAM/TRACKING +/- buttons (8, 63)

13 Remote sensor (5)

14 REC SPEED SP (Standard Play)/LP (Long Play)/EP (Extended Play) button (38)

15 COLOR SYSTEM button (35)

16 ONE TOUCH TUNING/RF (Radio Frequency) CHANNEL button (8, 10)

17 R<sup>2</sup> (Reality Regenerator) button (63)

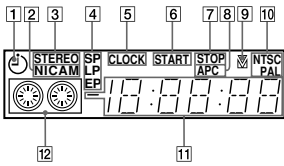
18 LINE-2 IN VIDEO/AUDIO L/R jacks (66)

continued

Additional Information | 73

Index to parts and controls (continued)

Display window



- 1 Timer indicator (41)

2 NICAM indicator (61)

3 STEREO indicator (61)

4 Tape speed indicator (38)

5 CLOCK indicator (42)

6 START indicator (40)

7 STOP indicator (40)
- 8 APC (Adaptive Picture Control) indicator (64)

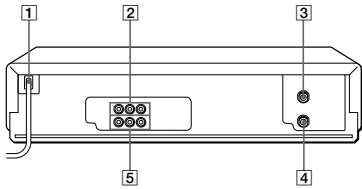
9 Tracking indicator (63)

10 Colour system indicator (35)

11 Time counter/clock/line/programme/TV system indicator (8, 36, 37, 42, 67)

12 Tape/recording indicator (38)

Rear panel



- 1 Mains lead (6)

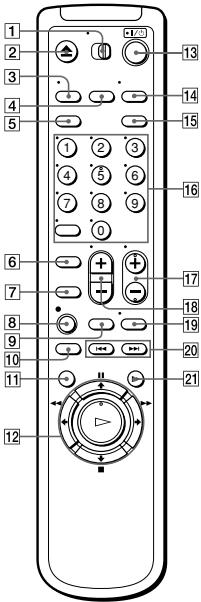
2 LINE-1 IN AUDIO R/L/VIDEO jacks (66)

3 AERIAL IN connector (6)
- 4 AERIAL OUT connector (6)

5 LINE OUT AUDIO R/L/VIDEO jacks (7)

74 | Additional Information

Remote commander



- 1 TV/VIDEO remote control switch (5)

2 EJECT button (35)

3 TV / VIDEO button (for TV) (5)

4 INPUT SELECT button (39, 50)

5 CLEAR button (36, 47, 60)

6 EASY TIMER button (43)

7 R<sup>2</sup>(Reality Regenerator) button (63)

8 ● REC button (38, 58)

9 REC SPEED button (38)

10 x2 button (57)

11 MENU button (11, 65)

12 Tape/menu operation buttons
- || PAUSE/↑ button (35)

■ STOP/↓ button (35)

◀◀ REW (rewind)/◀ button (35, 57)

▶▶ FF (fast-forward)/▶ button (35, 57)

▷ PLAY/OK button (35)
- 13 I/⏻ (on/standby) switch (47)

14 AUDIO MONITOR button (61)

15 G-CODE button (46)

16 Programme number /-/- (ten's digit) buttons (39, 43, 47)

17 PROG (programme) +/- buttons (37)

18 VOL (volume) +/- buttons (for TV)

19 DISPLAY button (38)

20 ◀◀/▶▶ INDEX SEARCH buttons (54)

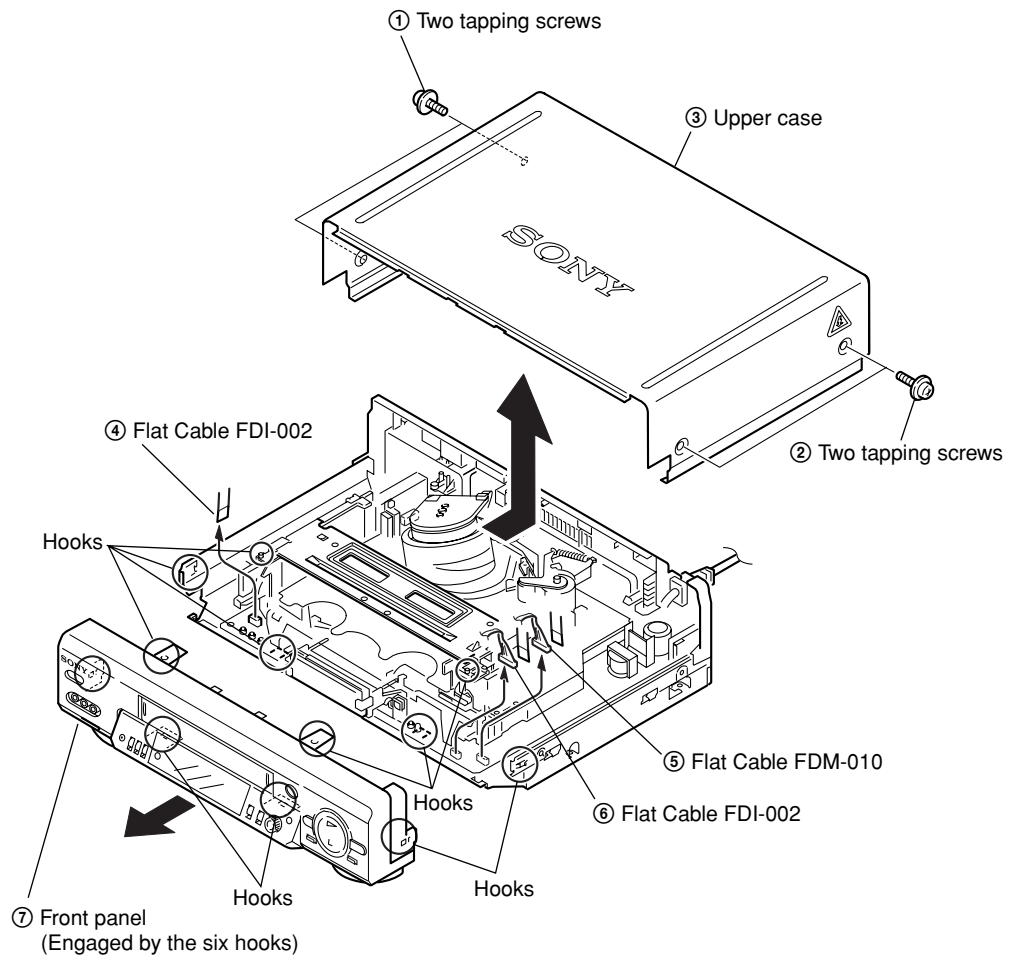
21 ► SLOW button (57)

Additional Information | 75

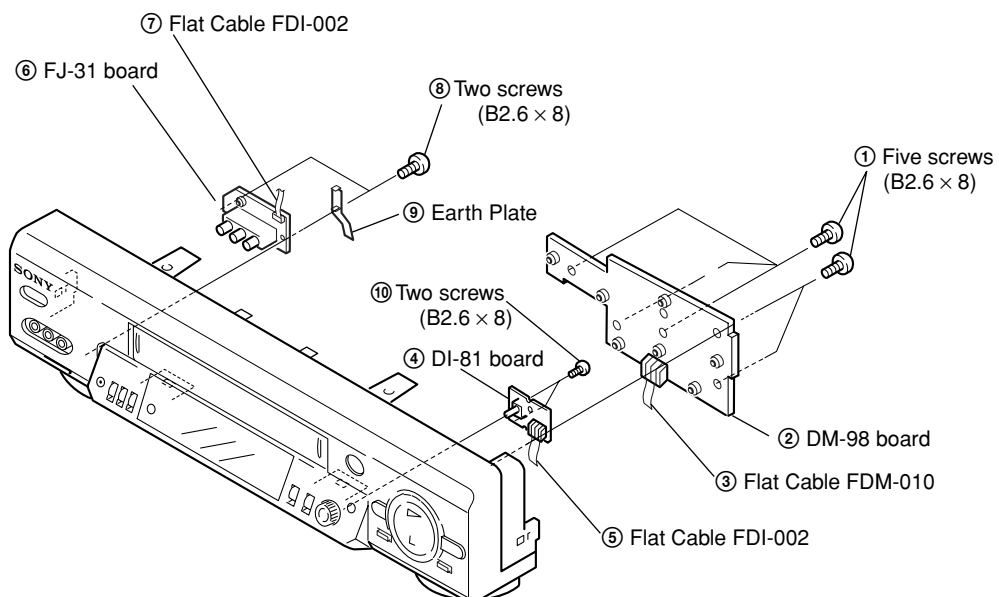
## SECTION 2 DISASSEMBLY

**NOTE:** Follow the disassembly procedure in the numerical order given.

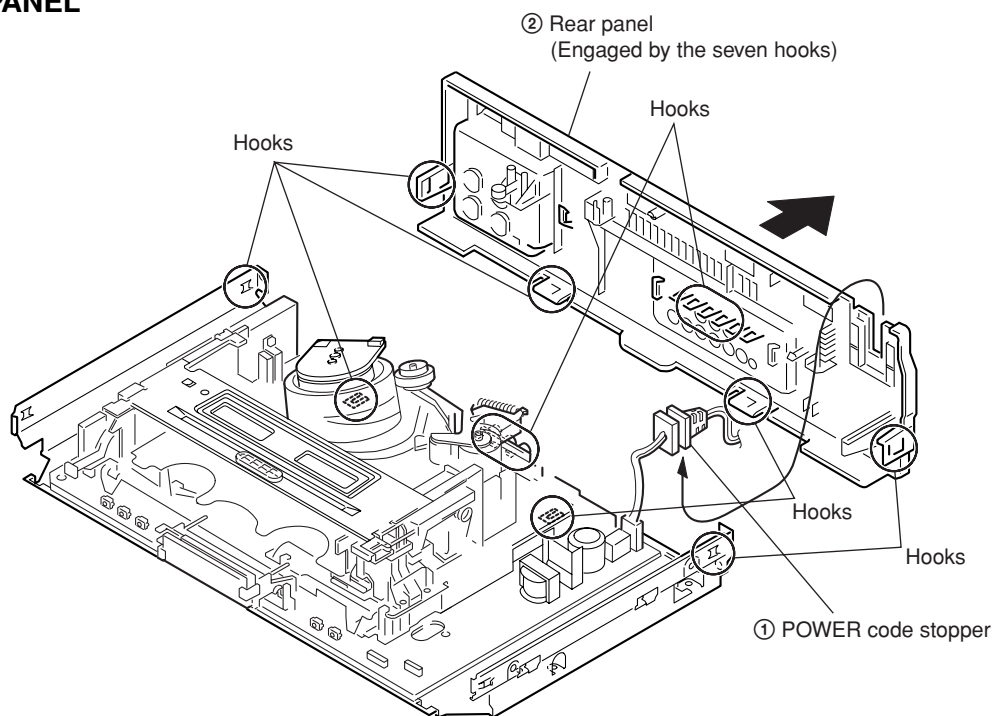
### 2-1. CASE, FRONT PANEL BLOCK ASSEMBLY



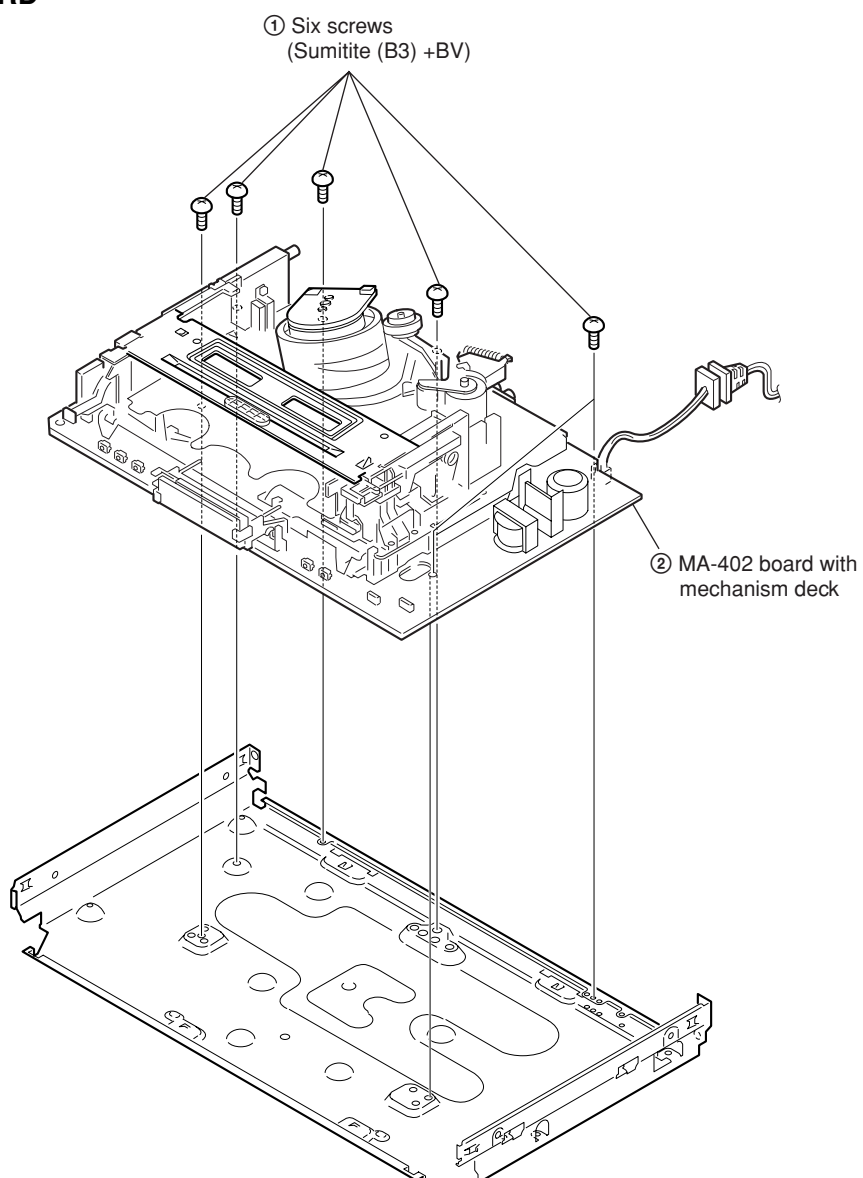
### 2-2. DM-98 BOARD, DI-81 BOARD, FJ-31 BOARD



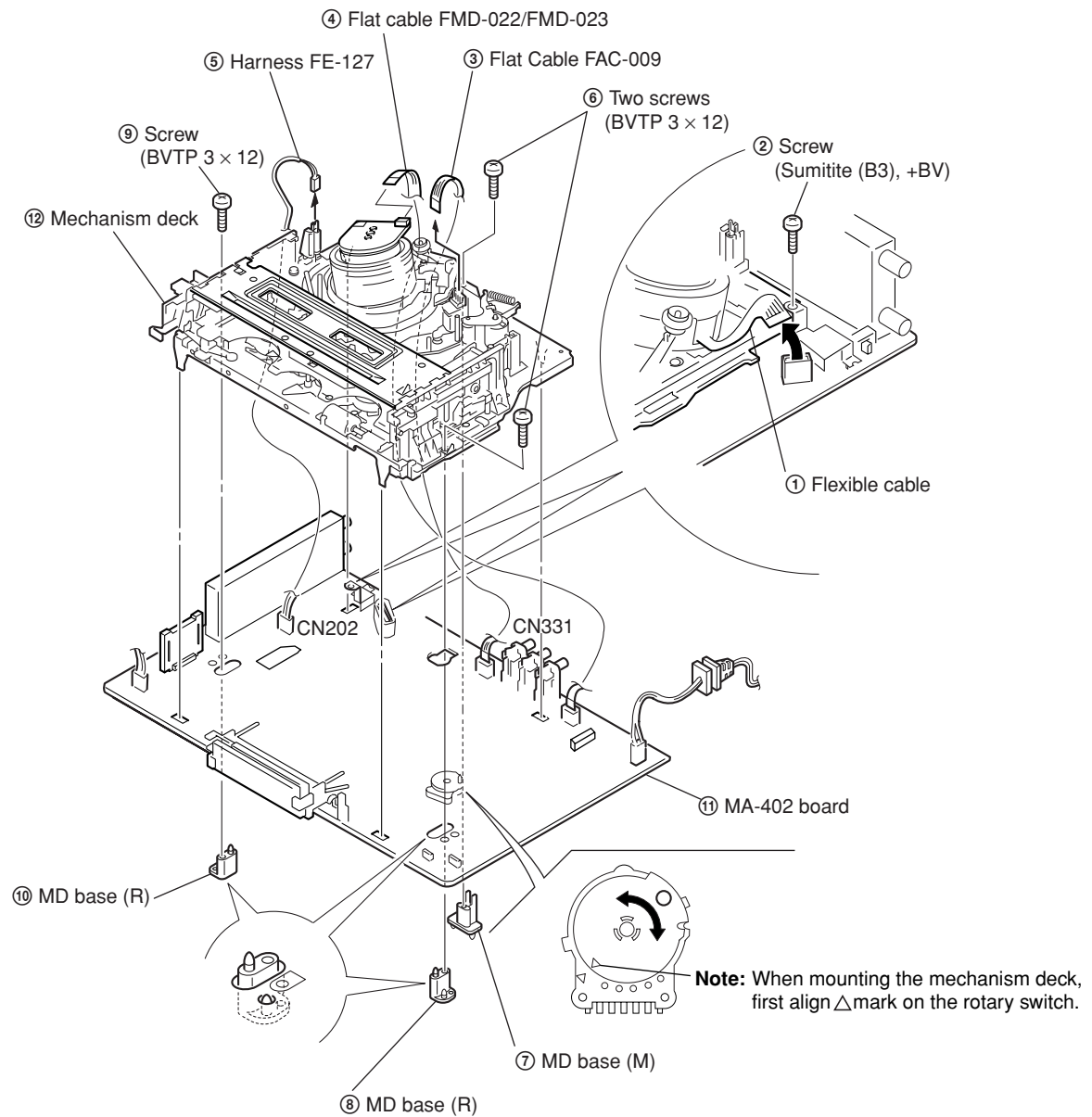
### 2-3. REAR PANEL



### 2-4. MA-402 BOARD

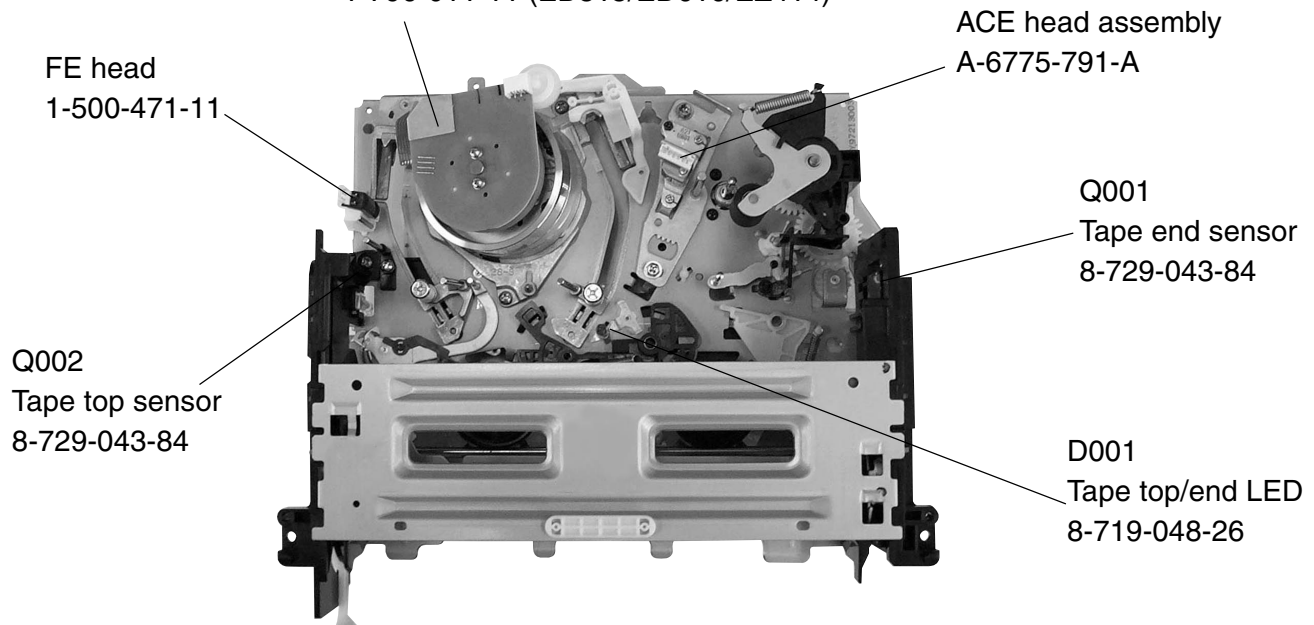


## 2-5. MECHANISM DECK



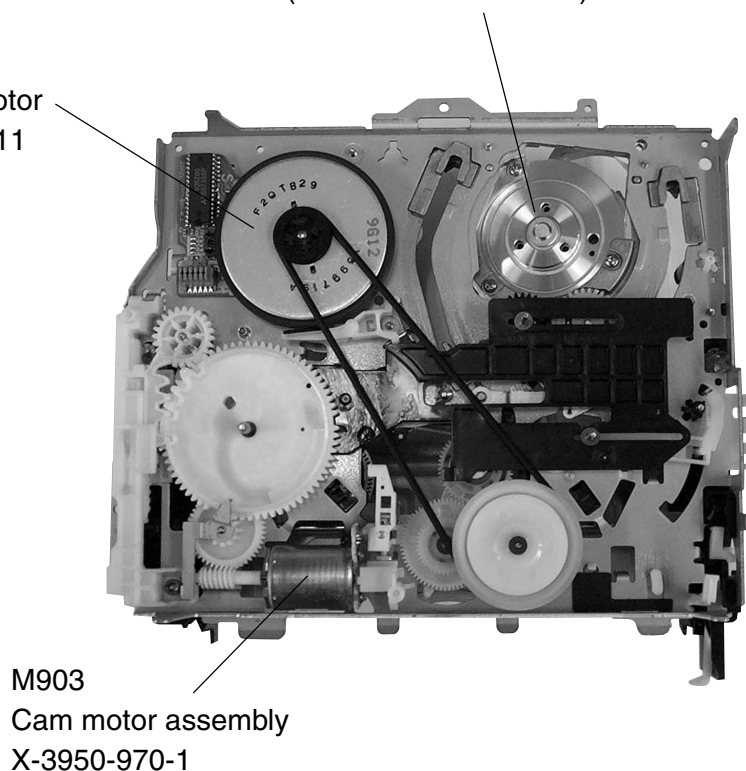
## 2-6. INTERNAL VIEWS

Drum assembly (M901) (DZH-89D-R)  
1-772-360-11 (ED115/ED215/ED313/EZ111/EZ212)  
Drum assembly (M901) (DZH-0D1A-R)  
1-796-012-11 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)  
Drum assembly (M901) (DZH-0D0A-R)  
1-796-011-11 (ED515/ED616/EZ414)

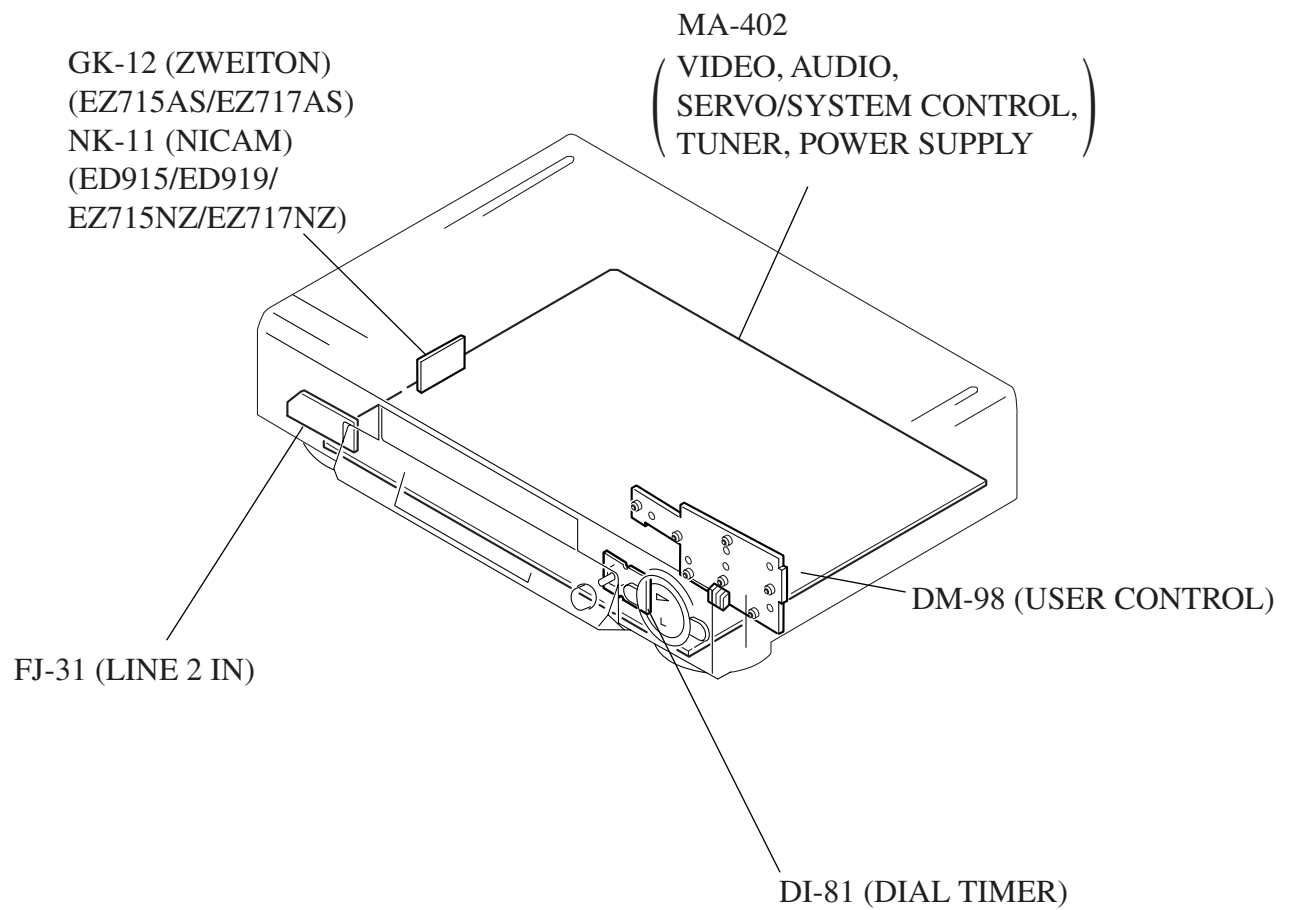


Drum assembly (M901) (DZH-89D-R)  
1-772-360-11 (ED115/ED215/ED313/EZ111/EZ212)  
Drum assembly (M901) (DZH-0D1A-R)  
1-796-012-11 (ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)  
Drum assembly (M901) (DZH-0D0A-R)  
1-796-011-11 (ED515/ED616/EZ414)

M902  
Capstan motor  
1-763-572-11

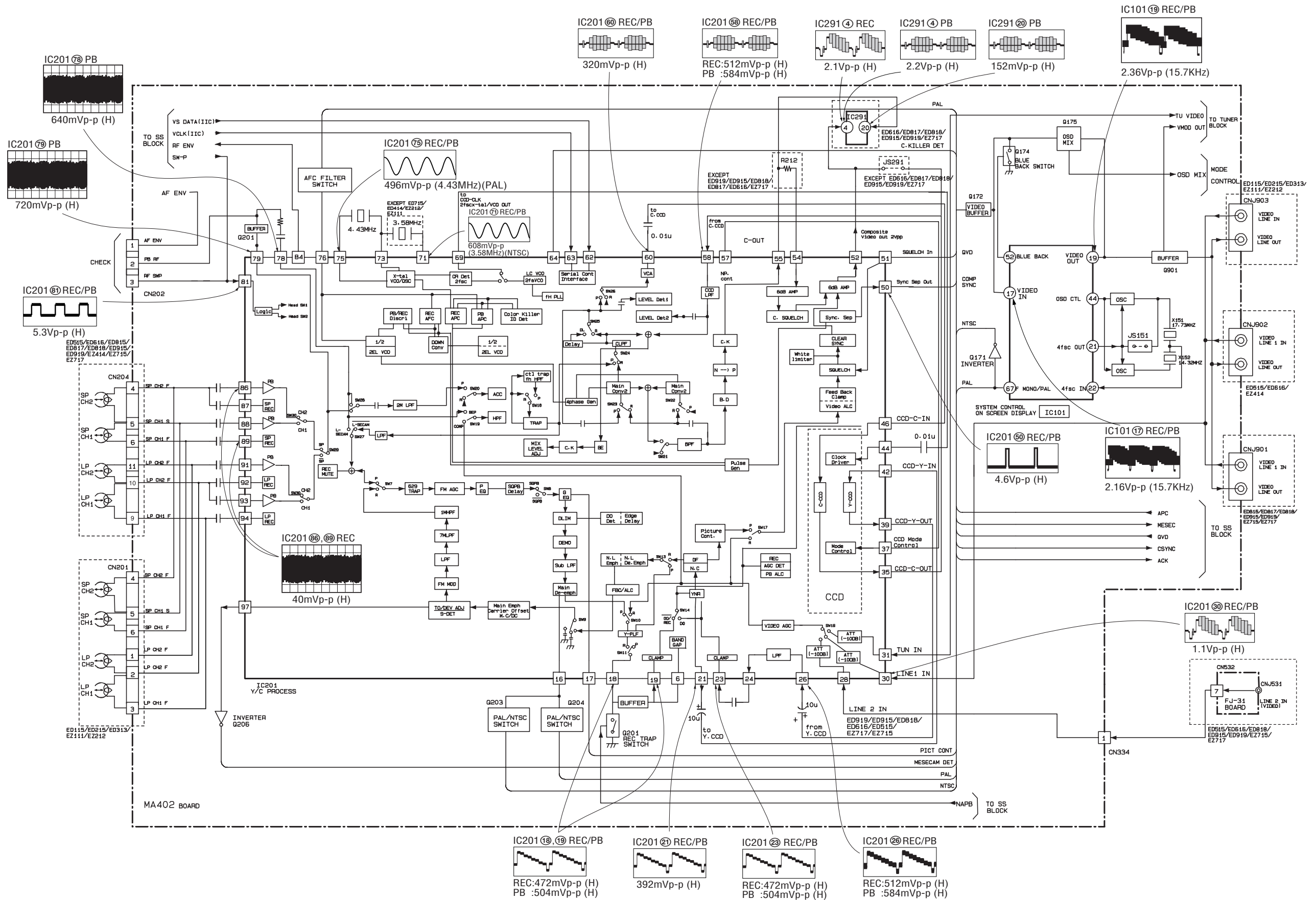


## 2-7. CIRCUIT BOARDS LOCATION

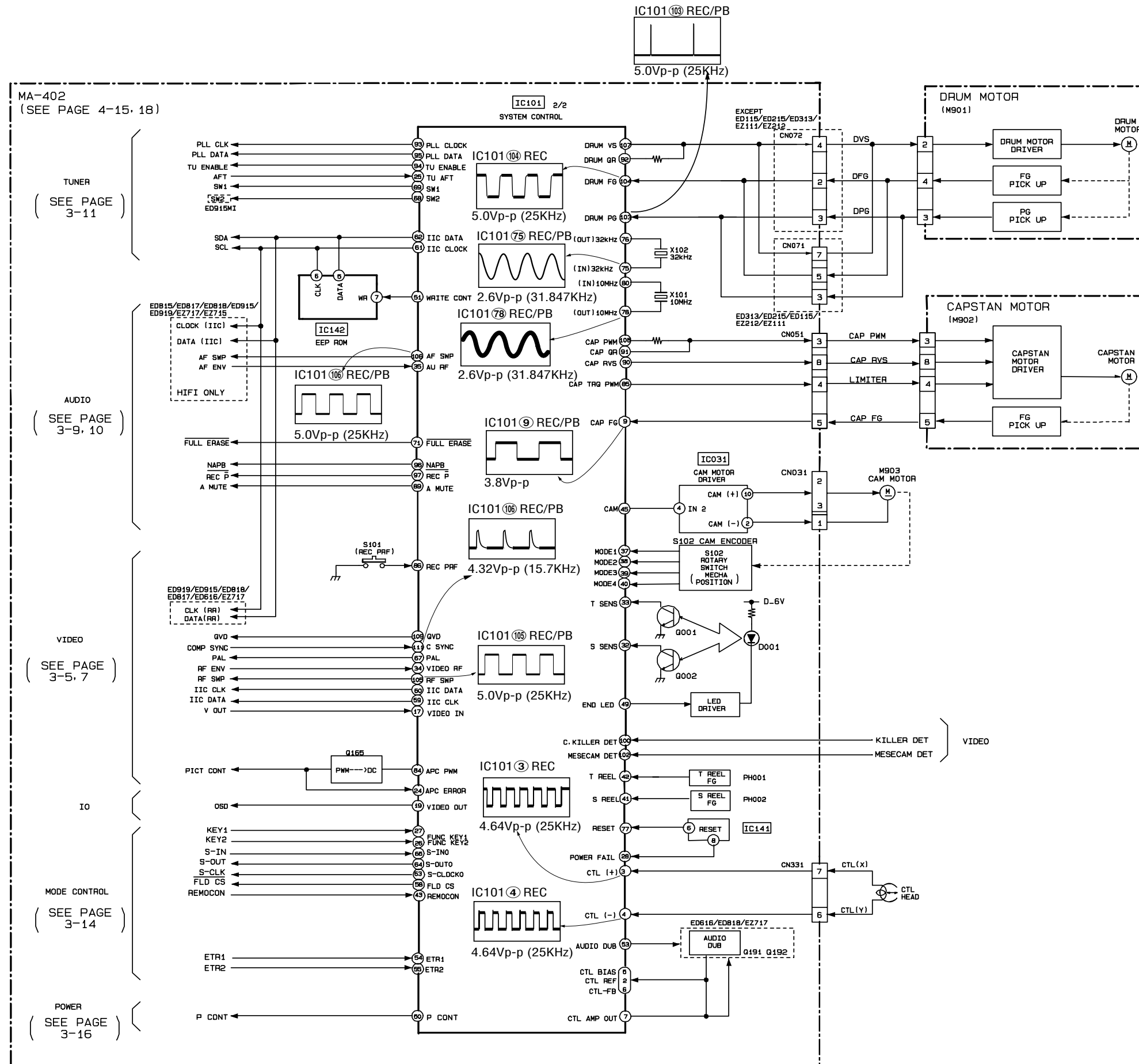




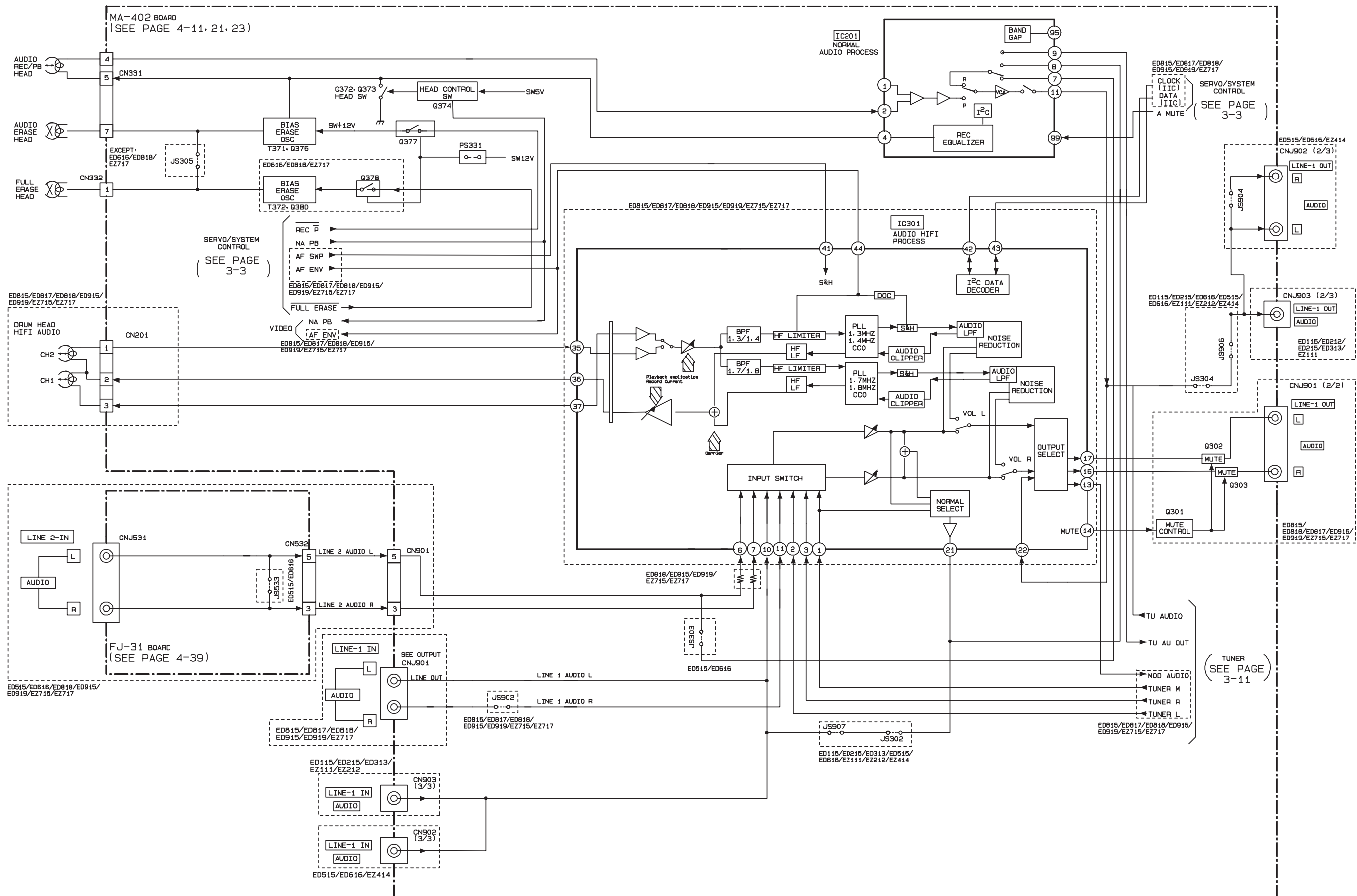
3-2. VIDEO BLOCK DIAGRAM



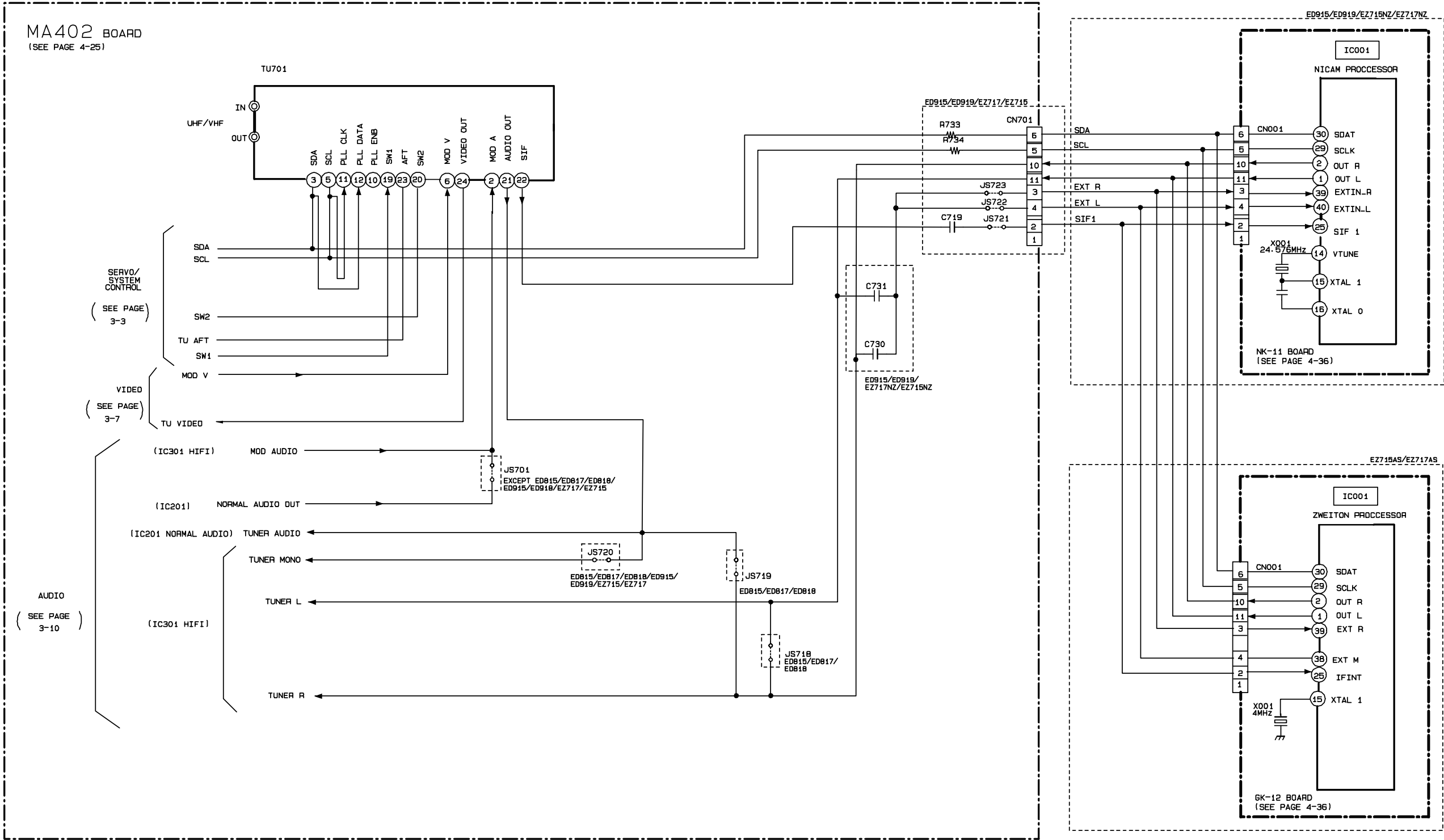
### 3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



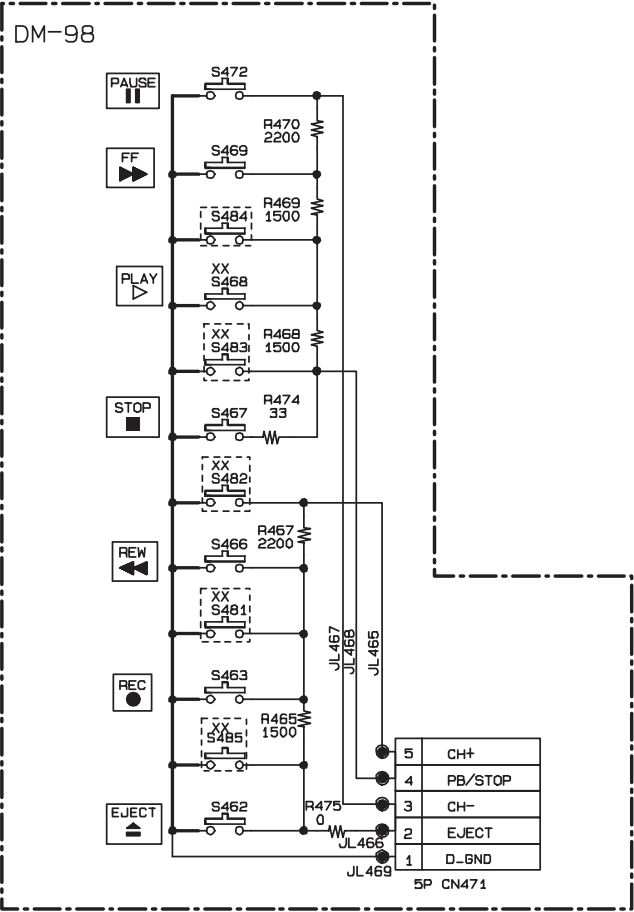
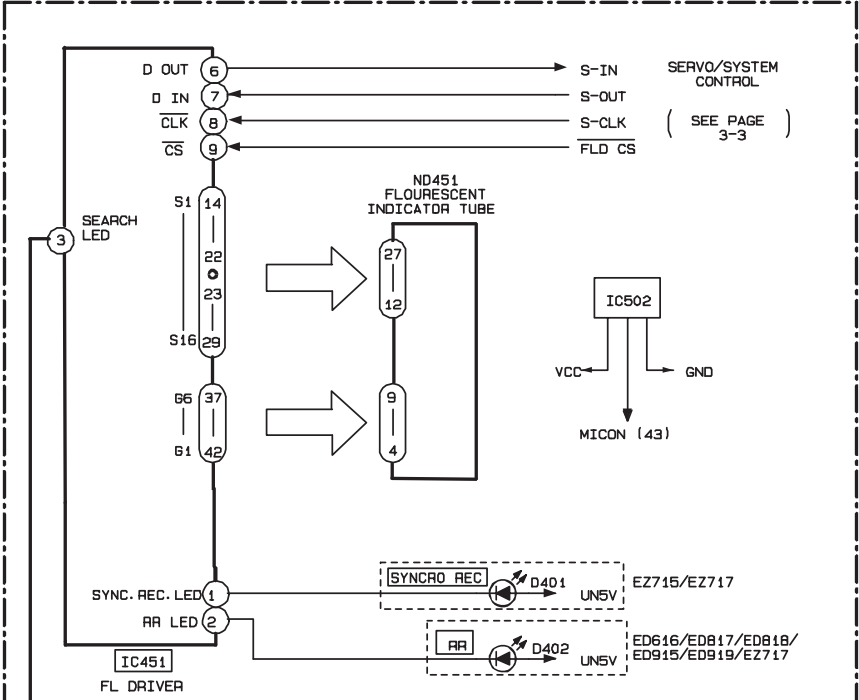
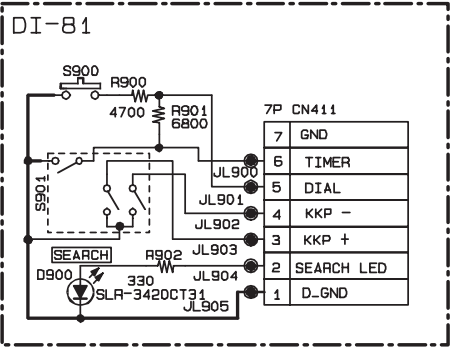
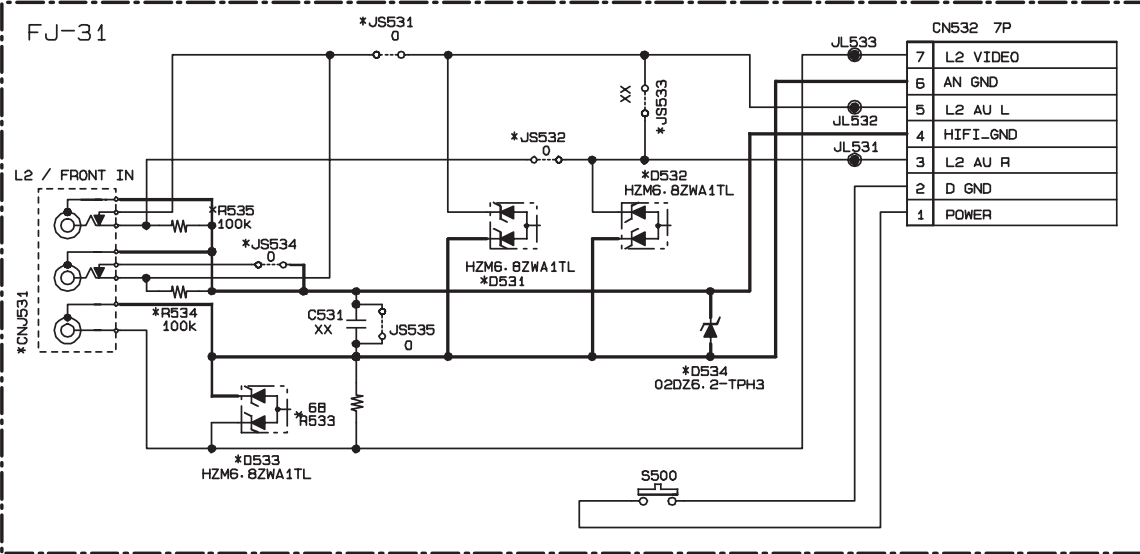
### 3-4. AUDIO BLOCK DIAGRAM



3-5. TUNER BLOCK DIAGRAM



3-6. MODE CONTROL BLOCK DIAGRAM





## SECTION 4

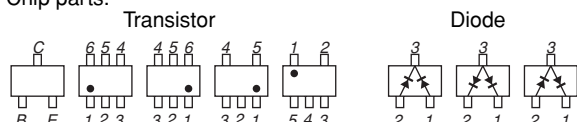
### PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

#### THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)

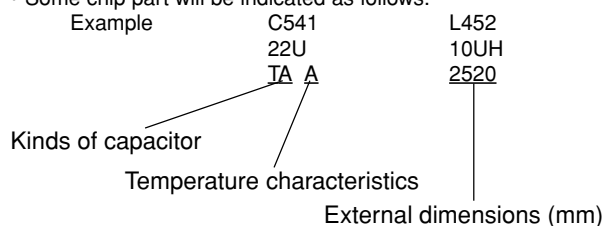
##### (For printed wiring boards)

-  : Pattern from the side which enables seeing.  
(The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



##### (For schematic diagrams)

- All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF} : \mu\mu\text{F}$ .  
50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.  
 $\text{k}\Omega=1000\Omega$ ,  $\text{M}\Omega=1000\text{k}\Omega$ .
- Caution when replacing chip parts.  
New parts must be attached after removal of chip.  
Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.



- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.  
In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination.  
Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name  
XEDIT → EDIT PB/XREC → PB/REC
-  : non flammable resistor
-  : fusible resistor
-  : panel designation
-  : internal component.
-  : B+ Line.
-  : B- Line.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10M $\Omega$ ).
- Voltage variations may be noted due to normal production tolerances.
-  : adjustment for repair.
- Circled numbers refer to waveforms.

When indicating parts by reference number, please include the board name.

##### Note :

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety.  
Replace only with part number specified.



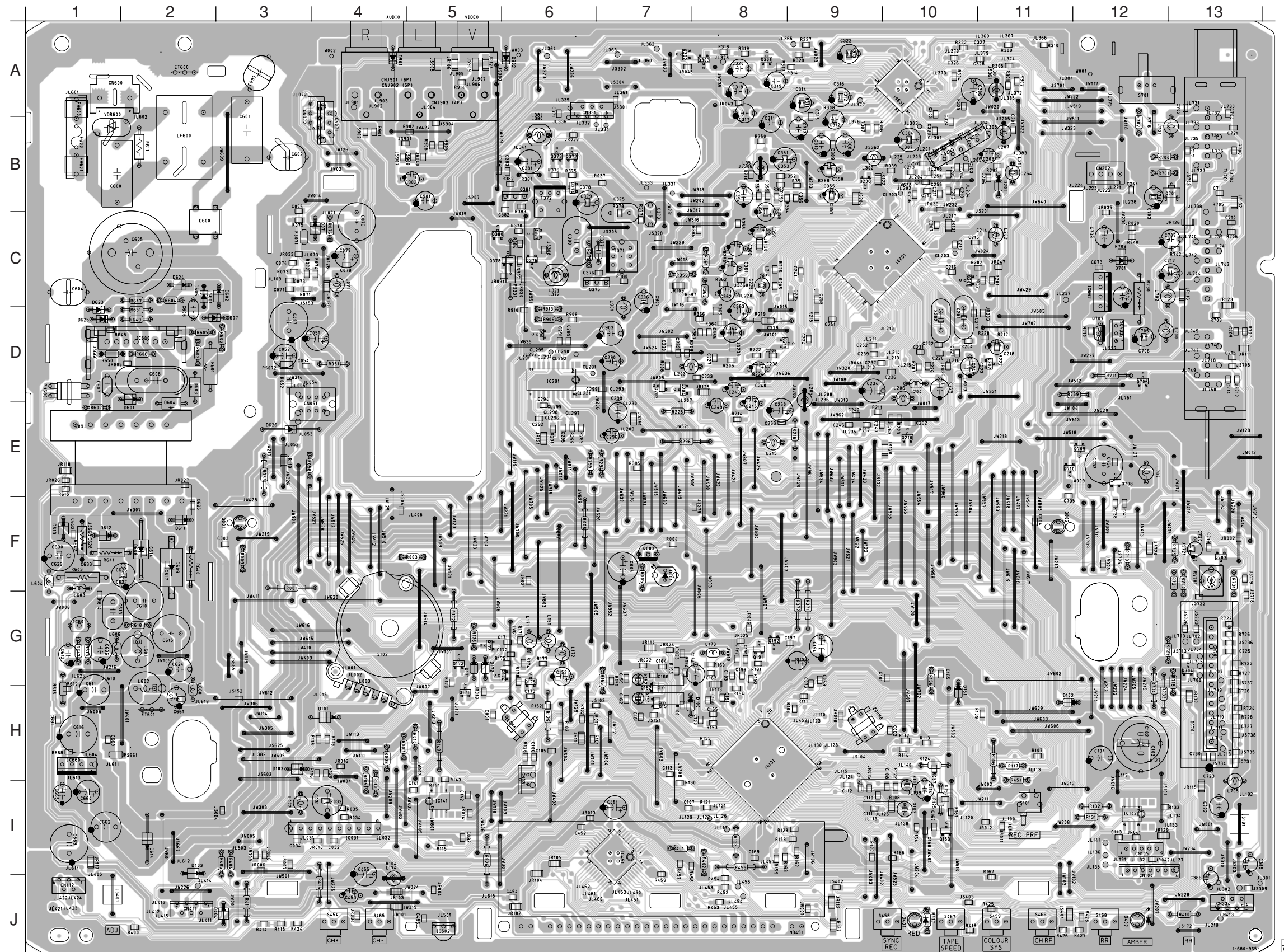
## 4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

# MA-402 (VIDEO, AUDIO, I/O, SERVO/SYSTEM CONTROL, TUNER, MODE CONTROL, POWER SUPPLY) PRINTED WIRING BOARD

— Ref. No. MA-402 Board:1,000 Series —

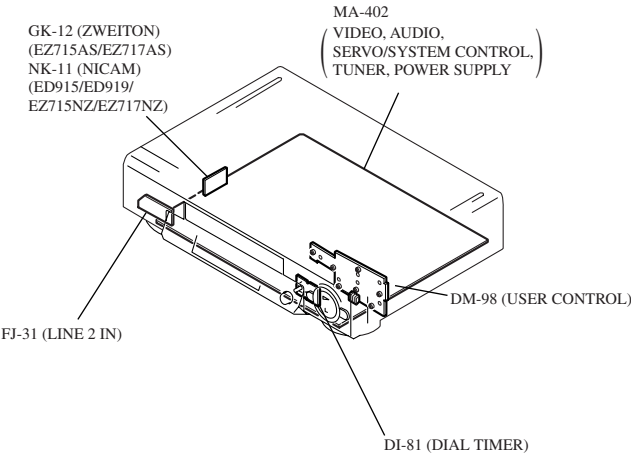
**MA-402 Board**

There are few cases that the part printed on this diagram isn't mounted in this model.



MA-402 BOARD

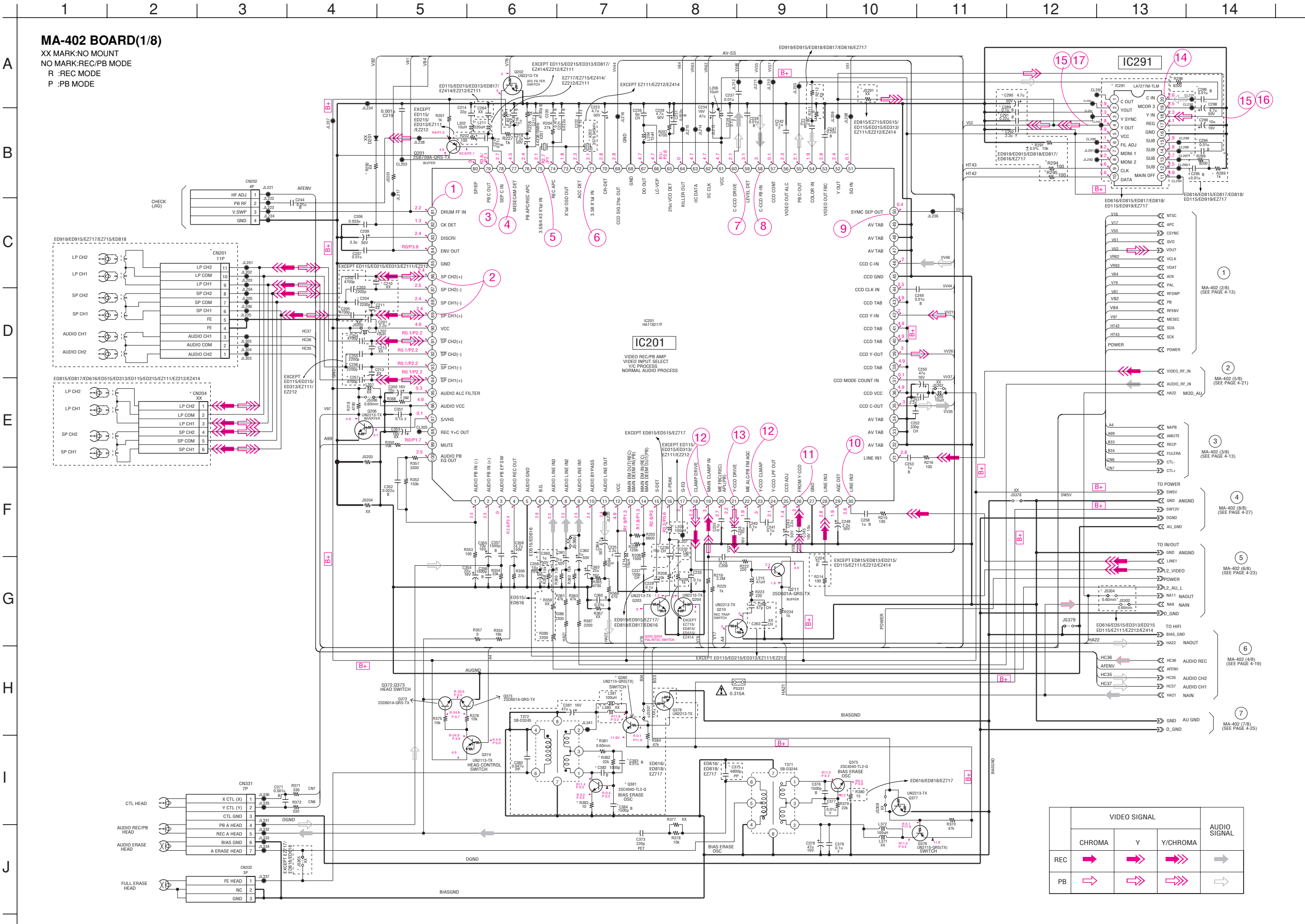
|       |      |       |      |
|-------|------|-------|------|
| CN031 | H-6  | IC141 | I-5  |
| CN051 | E-3  | IC142 | I-12 |
| CN071 | B-4  | IC201 | C-10 |
| CN072 | B-3  | IC291 | D-6  |
| CN104 | I-12 | IC301 | A-10 |
| CN105 | I-12 | IC451 | I-7  |
| CN201 | B-10 | IC502 | J-5  |
| CN202 | B-12 | IC600 | D-2  |
| CN204 | B-10 | IC601 | G-1  |
| CN331 | A-6  | IC660 | H-1  |
| CN332 | D-12 | IC662 | C-12 |
| CN334 | J-13 | IC701 | H-13 |
| CN411 | J-2  |       |      |
| CN412 | J-1  | Q001  | F-3  |
| CN413 | J-13 | Q002  | F-11 |
| CN600 | A-1  | Q003  | F-7  |
| CN701 | G-13 | Q151  | H-7  |
|       |      | Q152  | H-7  |
| D001  | F-7  | Q153  | I-10 |
| D071  | C-4  | Q171  | H-5  |
| D100  | H-8  | Q172  | G-5  |
| D101  | H-4  | Q173  | G-5  |
| D102  | H-11 | Q174  | G-5  |
| D103  | H-3  | Q175  | G-6  |
| D151  | H-10 | Q191  | G-8  |
| D171  | G-5  | Q192  | G-8  |
| D172  | G-5  | Q201  | C-10 |
| D201  | B-11 | Q202  | D-11 |
| D401  | J-10 | Q203  | D-7  |
| D402  | J-12 | Q204  | D-7  |
| D403  | I-2  | Q206  | B-9  |
| D404  | J-3  | Q210  | E-10 |
| D600  | C-2  | Q211  | D-8  |
| D601  | E-2  | Q301  | A-8  |
| D602  | C-3  | Q302  | A-7  |
| D603  | D-2  | Q303  | A-8  |
| D604  | E-2  | Q372  | B-6  |
| D605  | C-2  | Q373  | B-6  |
| D607  | D-3  | Q374  | B-6  |
| D608  | F-2  | Q375  | C-6  |
| D609  | F-2  | Q376  | C-6  |
| D611  | F-2  | Q377  | C-6  |
| D612  | F-1  | Q378  | C-5  |
| D613  | F-1  | Q380  | C-5  |
| D614  | I-2  | Q381  | B-6  |
| D623  | C-1  | Q701  | B-13 |
| D624  | C-2  | Q703  | F-13 |
| D625  | D-1  | Q704  | G-13 |
| D626  | E-3  | Q706  | D-12 |
| D701  | C-12 | Q707  | D-12 |
| D901  | A-4  | Q708  | E-12 |
| D902  | A-6  | Q709  | E-12 |
|       |      | Q710  | E-11 |
| IC031 | I-4  | Q901  | D-6  |
| IC101 | H-8  |       |      |



SLV-ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ111/EZ212/EZ414/EZ715/EZ717

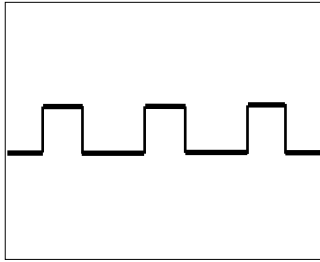
MA-402 (VIDEO, AUDIO) SCHEMATIC DIAGRAM

- Ref. No: MA-402 Board; 1000 series -
- See page 4-5 for printed wiring board.



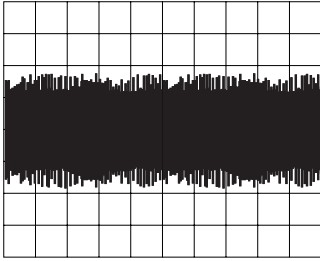
**MA-402 BOARD (1/8)**  
(VIDEO, AUDIO BLOCK)

❶ IC201 ⑥ REC/PB



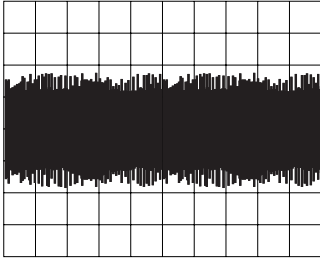
5.3 Vp-p (H)

❷ IC201 ⑧, ⑨ REC



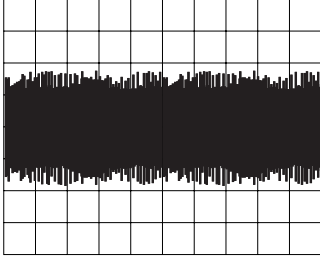
40 mVp-p (H)

❸ IC201 ⑦ PB



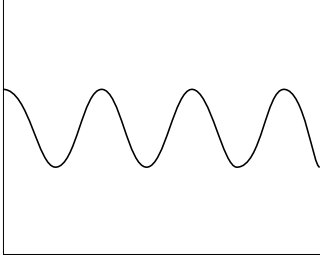
720 mVp-p (H)

❹ IC201 ⑦ PB



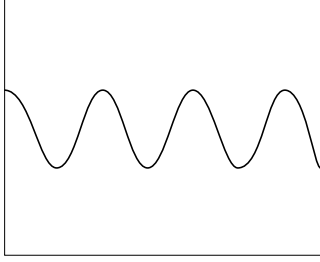
640 mVp-p (H)

❺ IC201 ⑦ REC/PB



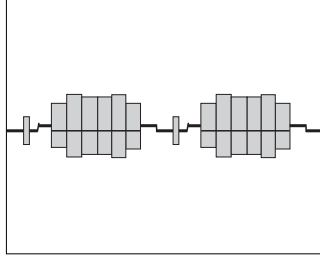
496 mVp-p (4.43 MHz) (PAL)

❻ IC201 ⑦ REC/PB



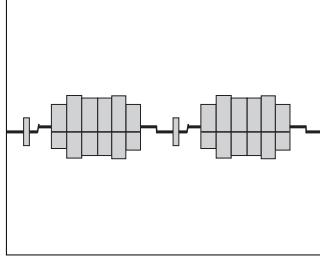
608 mVp-p (3.58 MHz) (NTSC)

❼ IC201 ⑥ REC/PB



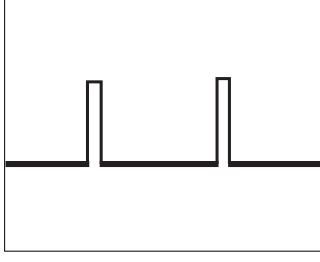
320 mVp-p (H)

❽ IC201 ⑧ REC/PB



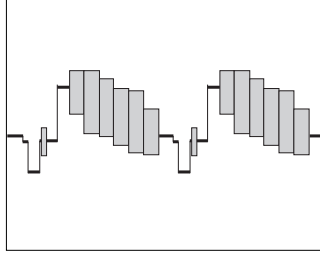
REC: 512 mVp-p (H)  
PB : 584 mVp-p (H)

❾ IC201 ⑧ REC/PB



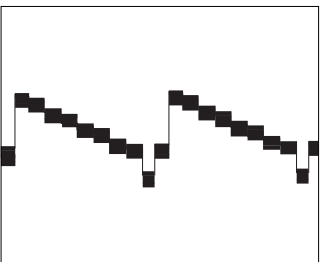
4.6 Vp-p (H)

❿ IC201 ⑩ REC/PB



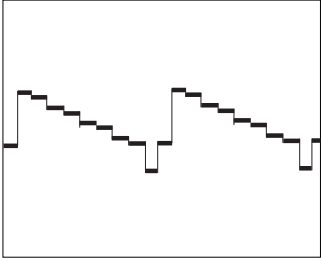
1.1 Vp-p (H)

⓫ IC201 ⑥ REC/PB



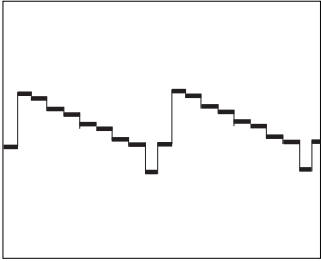
REC: 512 mVp-p (H)  
PB : 584 mVp-p (H)

⓬ IC201 ⑧, ⑨, ⑩ REC/PB



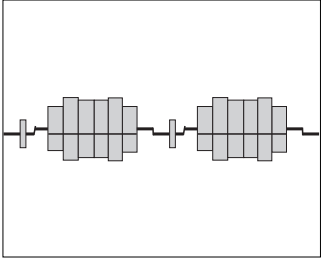
REC: 472 mVp-p (H)  
PB : 504 mVp-p (H)

⓭ IC201 ⑩ REC/PB



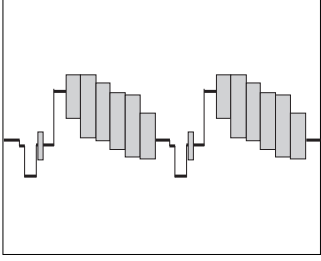
392 mVp-p (H)

⓮ IC291 ⑩ PB



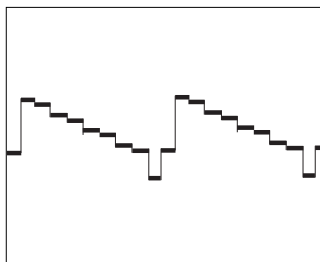
152 mVp-p (H)

⓯ IC291 ④, ⑩ REC



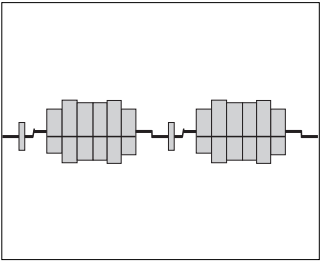
2.1 Vp-p (H)

⓰ IC291 ⑩ PB



1.9 Vp-p (H)

⓱ IC291 ④ PB

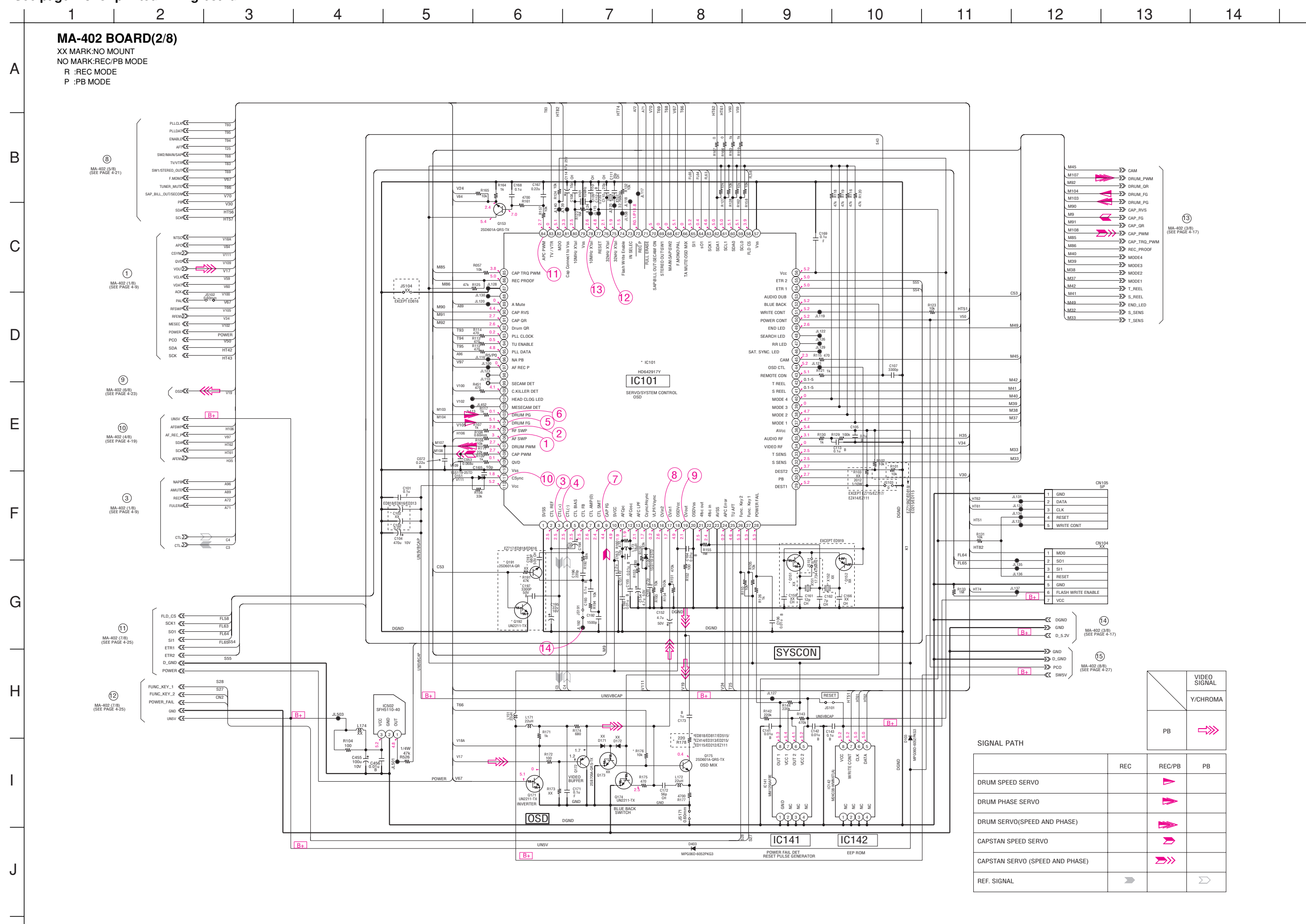


2.2 Vp-p (H)

### MA-402 (SYSTEM CONTROL) SCHEMATIC DIAGRAM

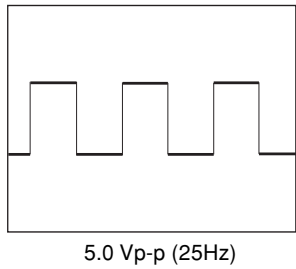
– Ref. No: MA-402 Board; 1000 series –

- See page 4-5 for printed wiring board.

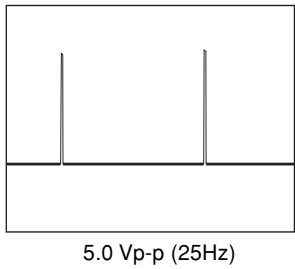


**MA-402 BOARD (2/8)**  
(SYSTEM CONTROL)

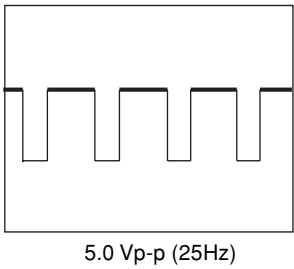
❶ IC101 ⑩ REC/PB



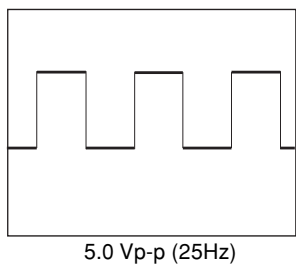
❷ IC101 ⑩ REC/PB



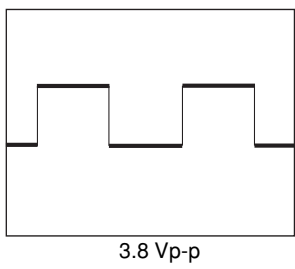
❸ IC101 ⑧ REC/PB



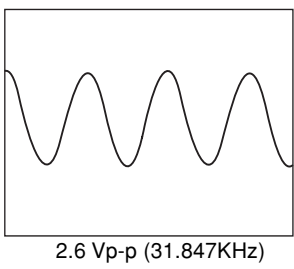
❹ IC101 ⑩ REC/PB



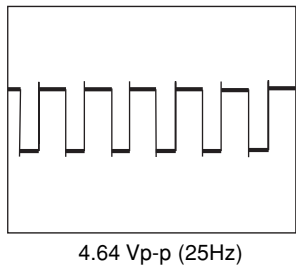
❺ IC101 ⑨ REC/PB



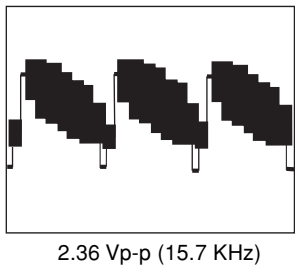
❻ IC101 ⑦ REC/PB



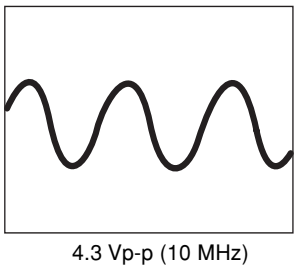
❼ IC101 ③ REC



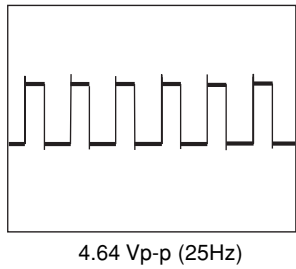
❽ IC101 ⑰ REC/PB



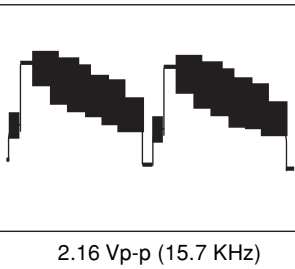
❾ IC101 ⑦ REC/PB



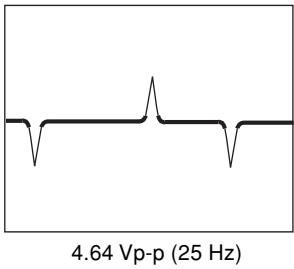
❿ IC101 ④ REC



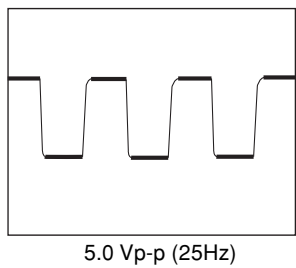
⓫ IC101 ⑰ REC/PB



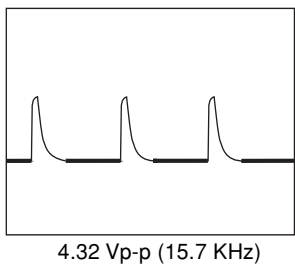
⓬ JL 192 PB



⓭ IC101 ⑩ REC



⓮ IC101 ⑪ REC/PB

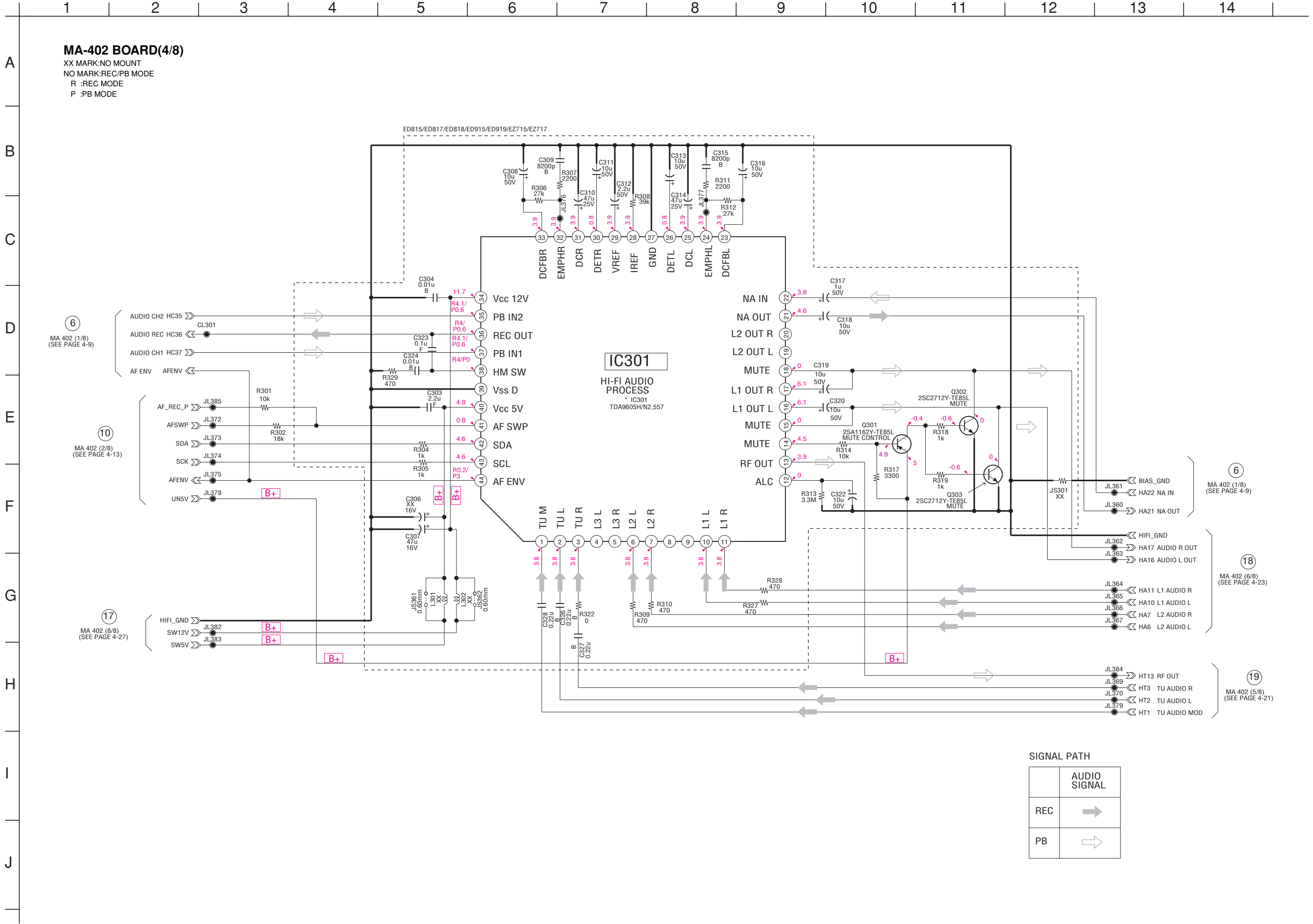




MA-402 (Hi-Fi AUDIO) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

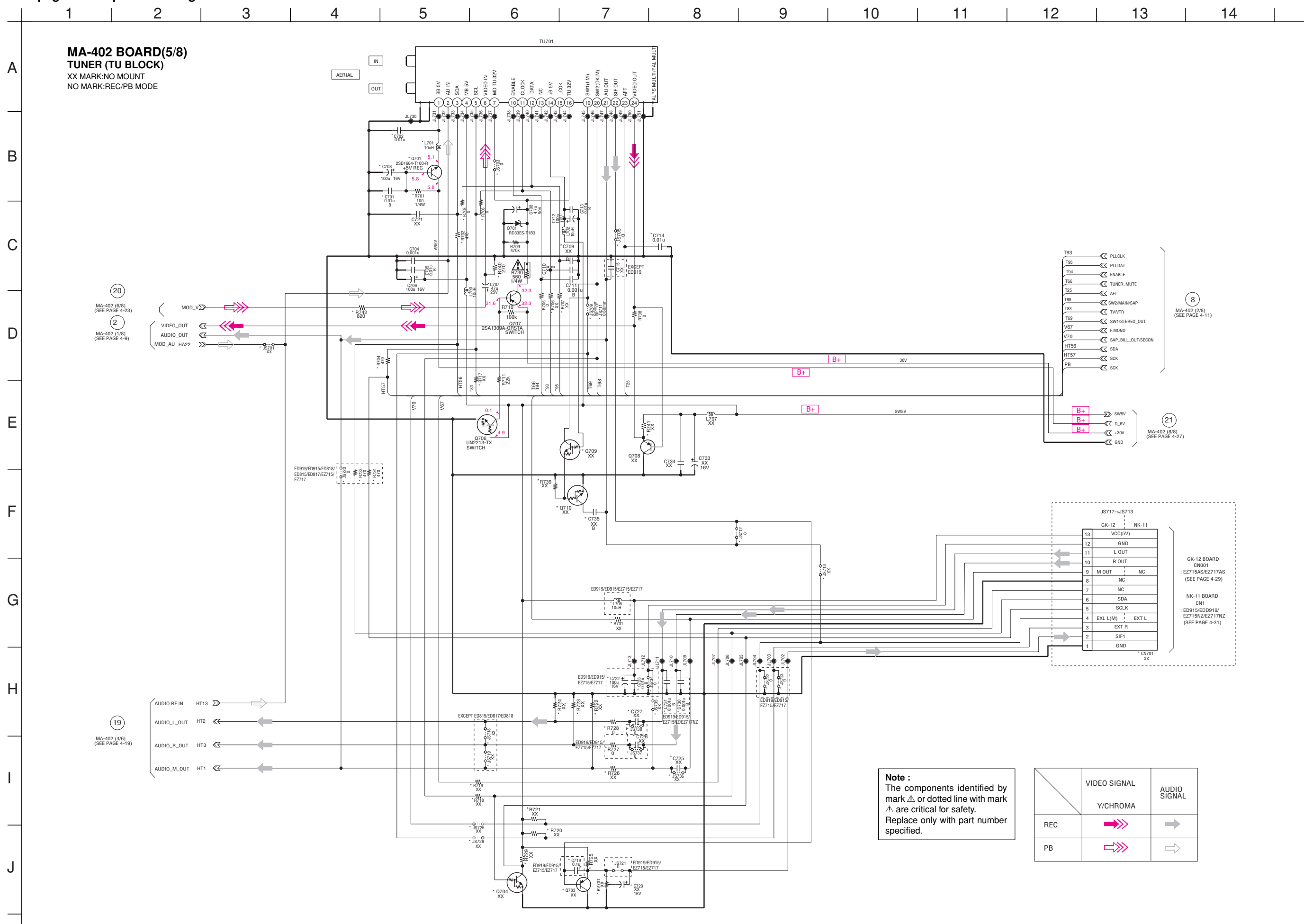
• See page 4-5 for printed wiring board.



## MA-402 (TUNER) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

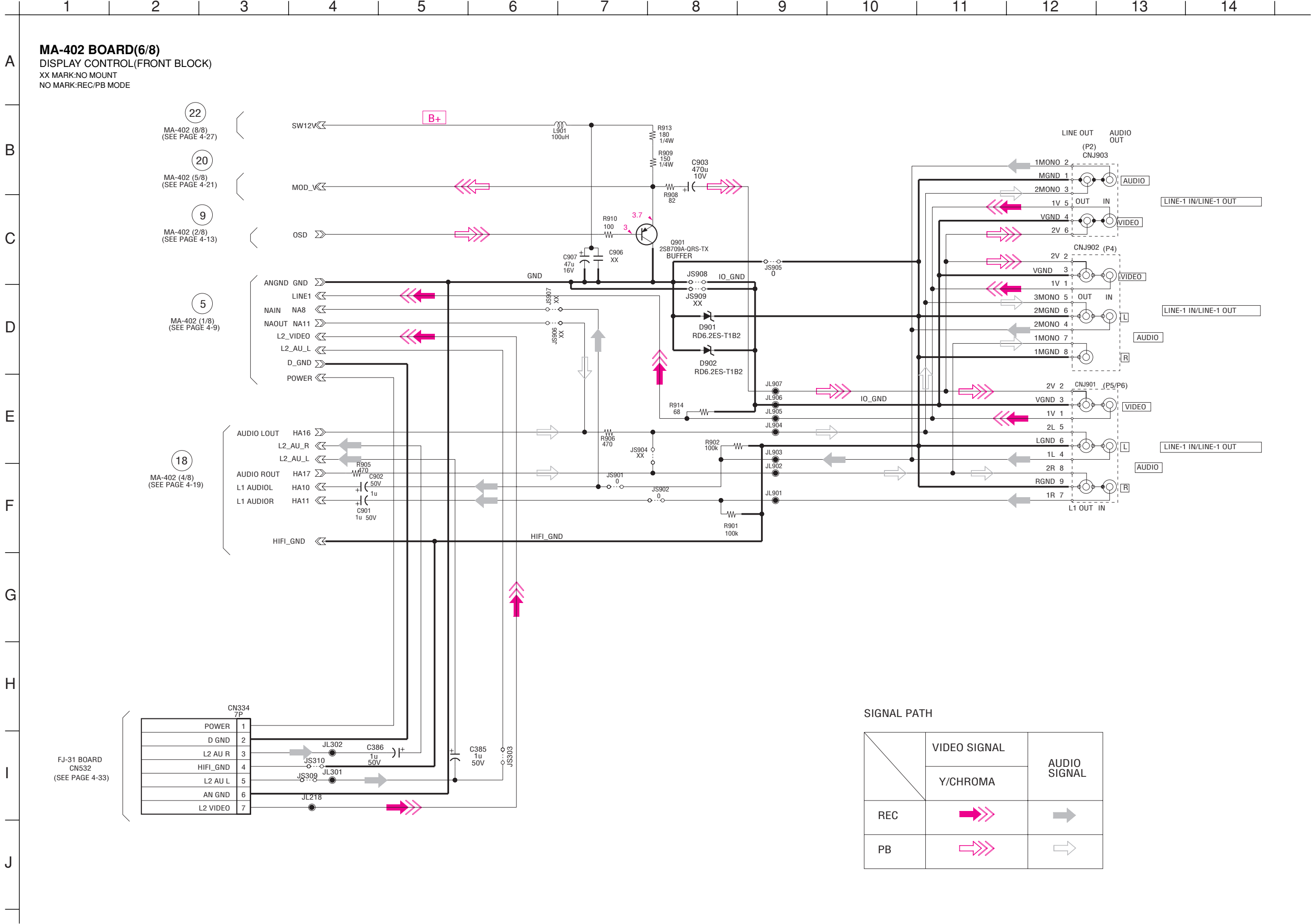
• See page 4-5 for printed wiring board.



MA-402 (I/O) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

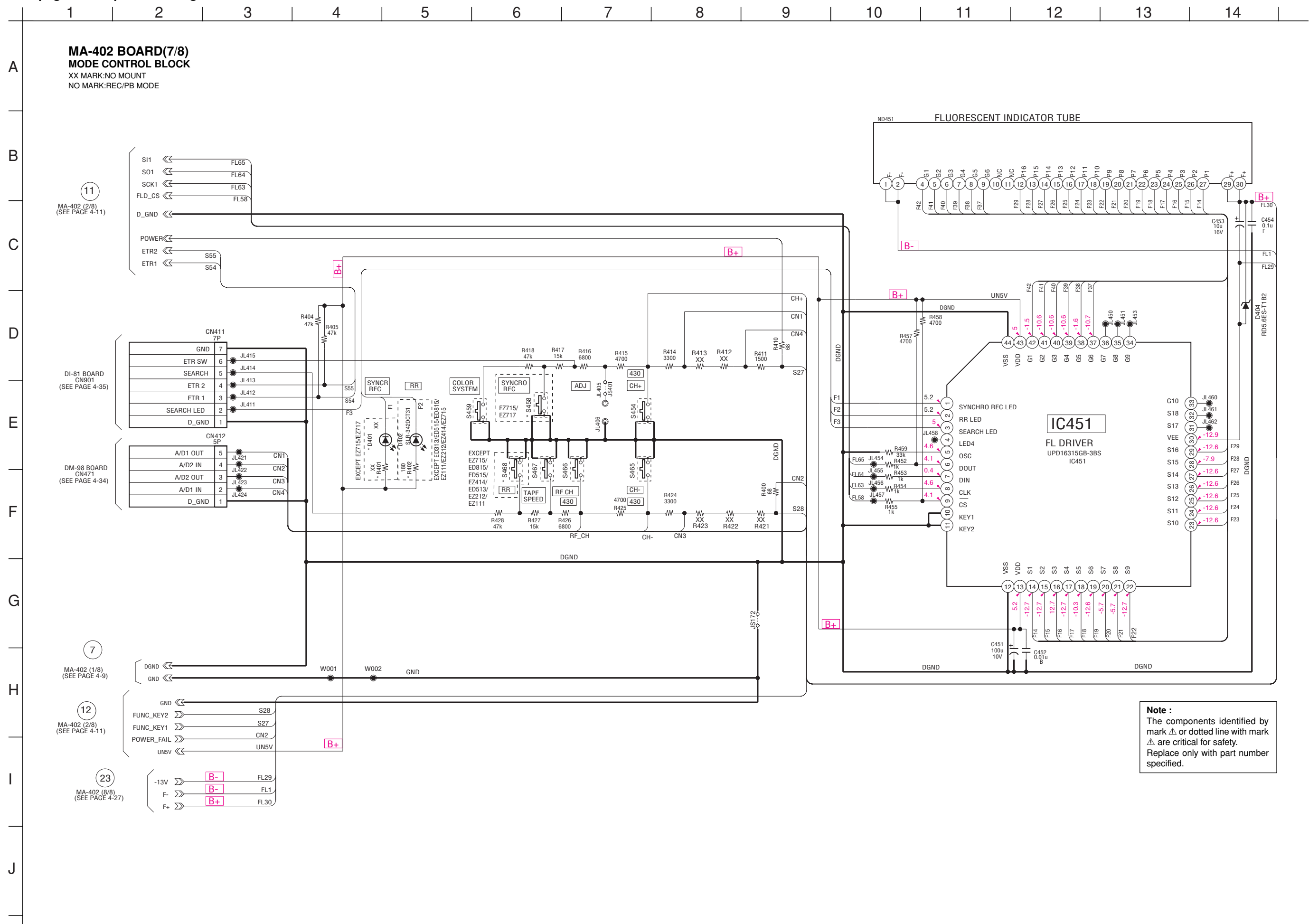
• See page 4-5 for printed wiring board.



### MA-402 (MODE CONTROL) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

- See page 4-5 for printed wiring board.

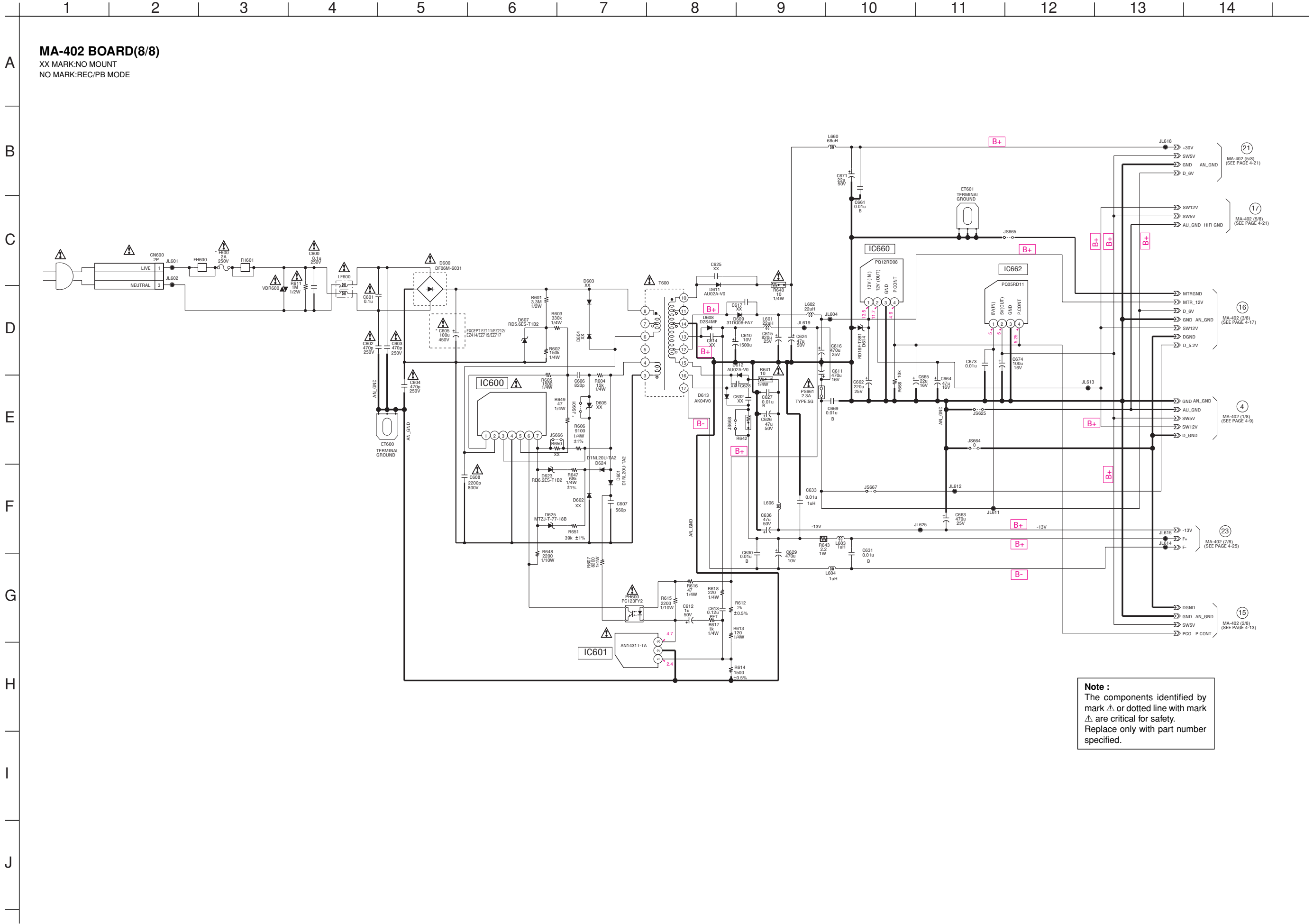


**Note :**  
The components identified by mark  or dotted line with mark  are critical for safety.  
Replace only with part number specified.

MA-402 (POWER SUPPLY) SCHEMATIC DIAGRAM

– Ref. No: MA-402 Board; 1000 series –

• See page 4-5 for printed wiring board.



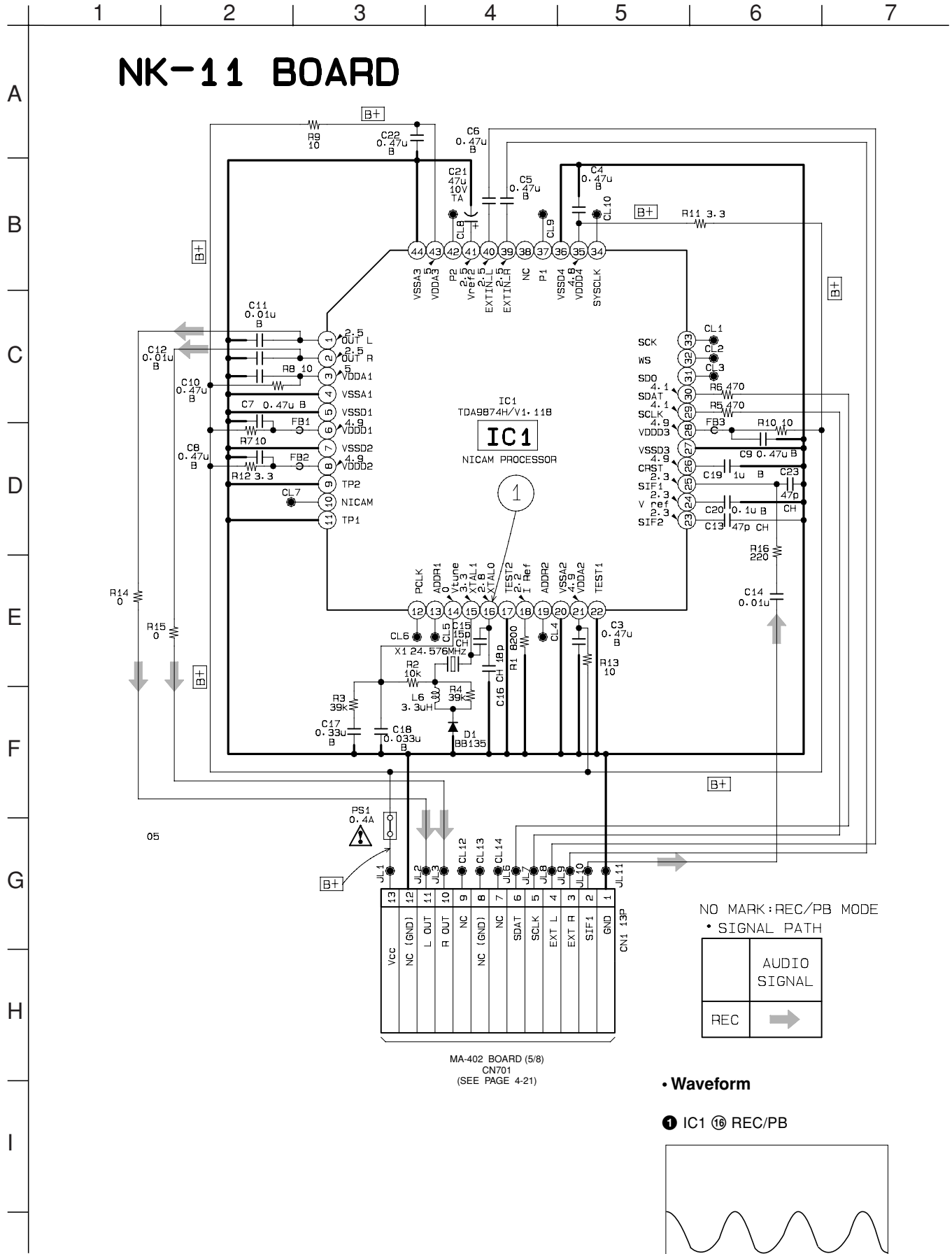


148 mVp-p (4 MHz)

NK-11 (NICAM) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

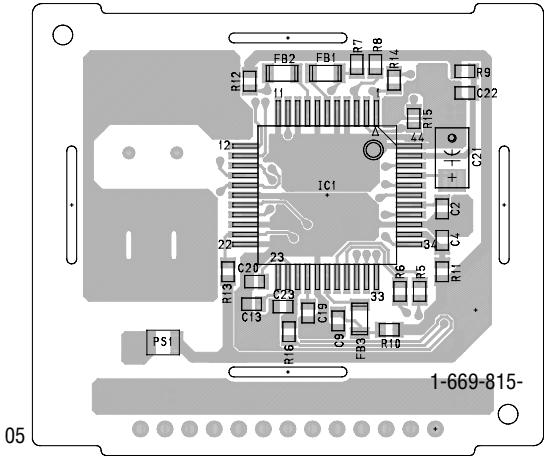
– Ref. No.: NK-11 board; 3,000 series –

– SLV-ED915/ED919/EZ715NZ/EZ717NZ –

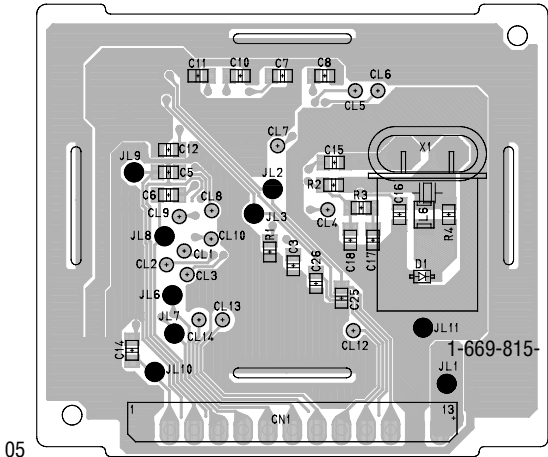


There are few cases that the part isn't mounted in this model is printed on this diagram.

NK-11 BOARD(SIDE A)



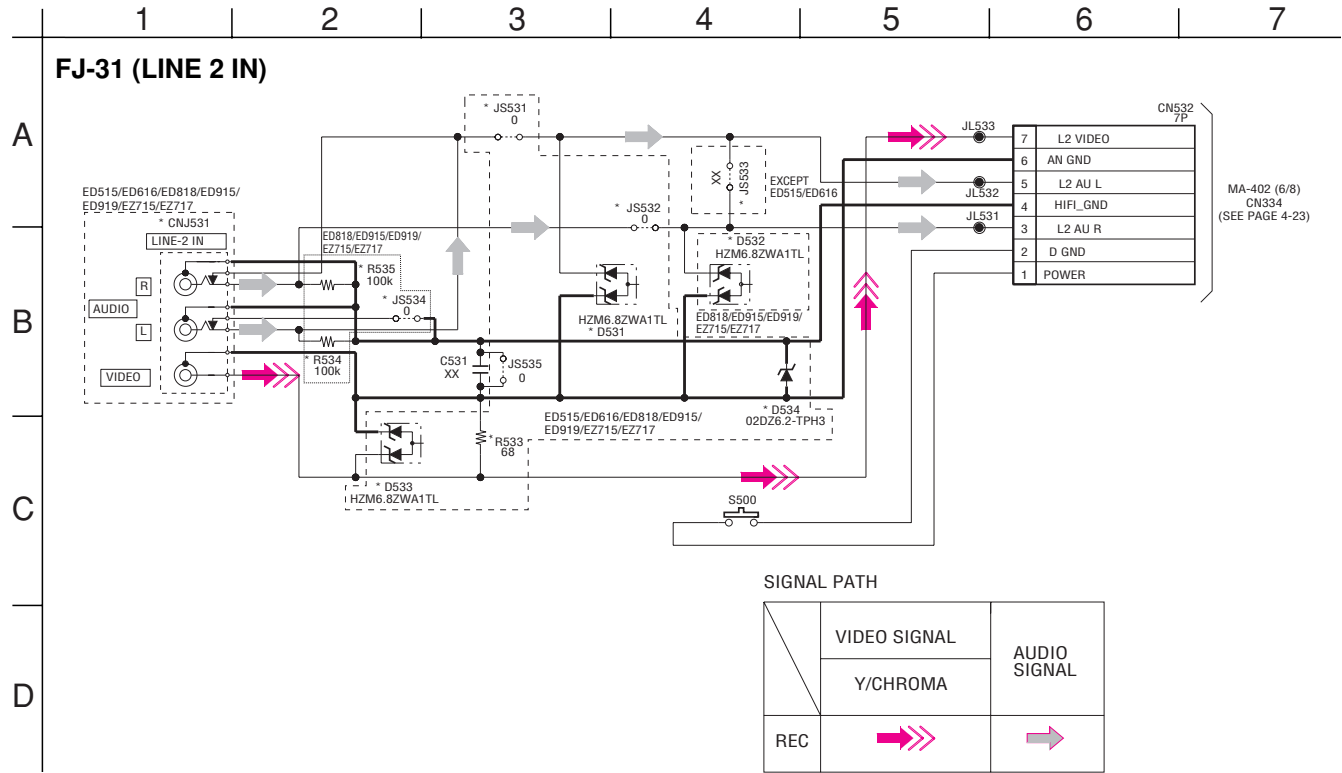
NK-11 BOARD(SIDE B)



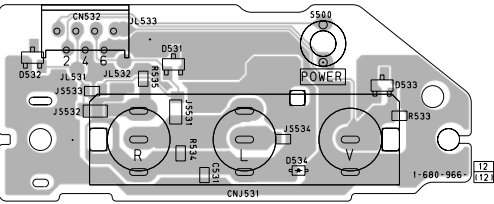
**Note:** The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety.  
Replace only with part number specified.

FJ-31 (LINE 2 IN) AND DM-98 (FUNCTION) PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

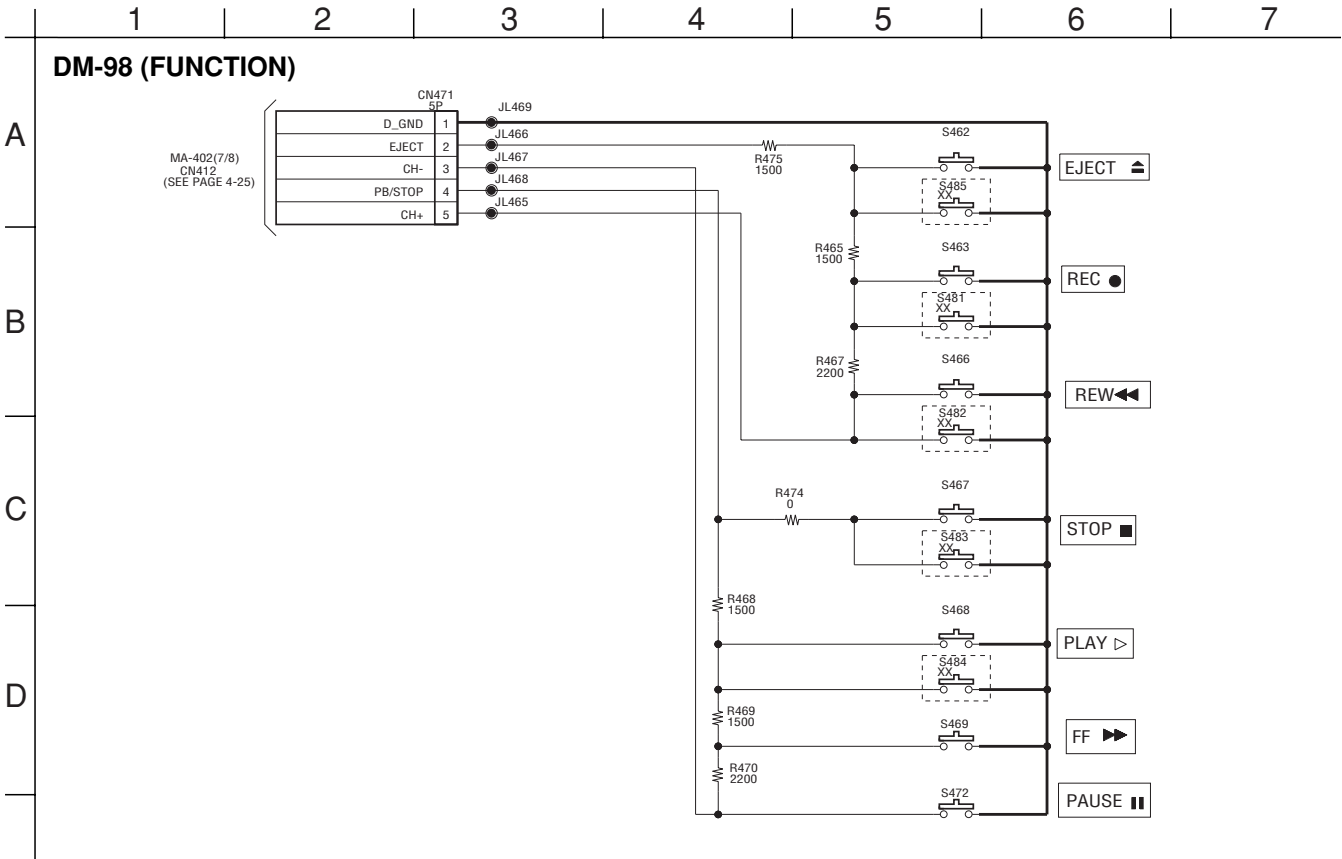
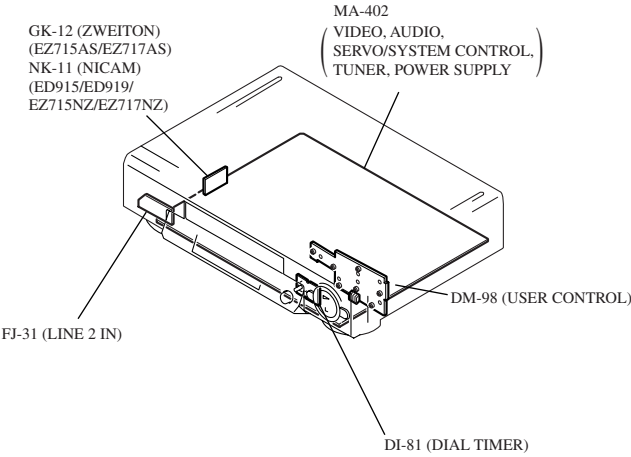
— Ref. No. FJ-31 Board:1,000 Series —  
— Ref. No. DM-98 Board:2,000 Series —



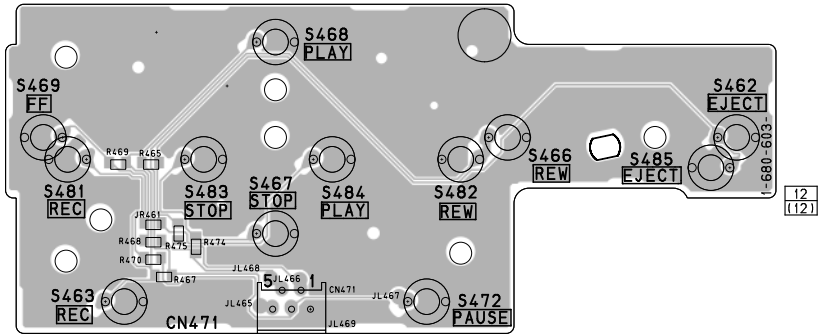
FJ-31 BOARD



There are few cases that the part printed on this diagram isn't mounted in this model.



DM-98 BOARD

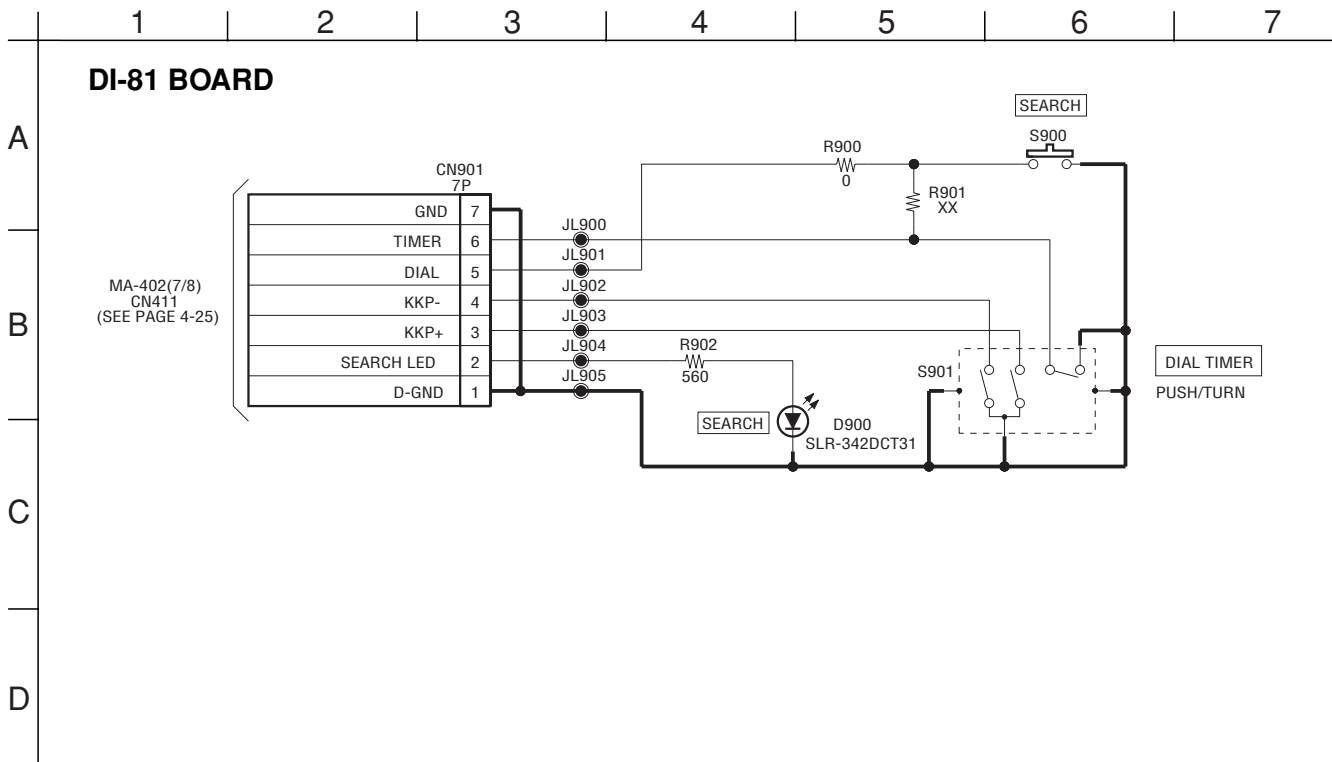
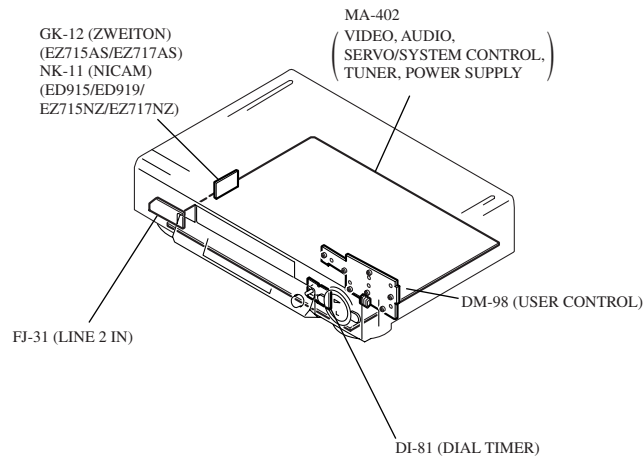
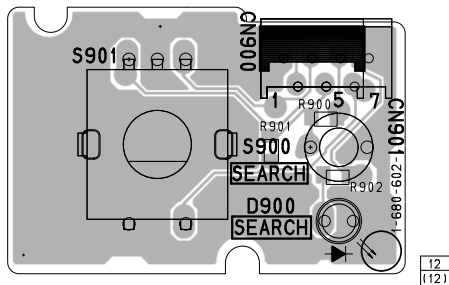


DI-81 (DIAL TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. DI-81 Board:2,000 Series —

DI-81 BOARD

There are few cases that the part printed on this diagram isn't mounted in this model.



SECTION 5  
INTERFACE, IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL – VIDEO BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal | Pin No.                          | I/O | STOP/<br>FF/REW | TAPE<br>THREADING | TAPE<br>UNTHREAD-<br>ING | PB | PB •<br>PAUSE | SLOW | x 2 | CUE | REVIEW | RECORD | REC •<br>PAUSE |
|--------|----------------------------------|-----|-----------------|-------------------|--------------------------|----|---------------|------|-----|-----|--------|--------|----------------|
| RF SWP | MA-402<br>IC101 <sup>(105)</sup> | O   | *1              | *1                | *1                       | *1 | *1            | *1   | *1  | *1  | *1     | *1     | *1             |
| QVD    | MA-402<br>IC101 <sup>(106)</sup> | O   | L               | L                 | L                        | *2 | *3            | *3   | *3  | *3  | *3     | *3     | *3             |
| C SYNC | MA-402<br>IC101 <sup>(111)</sup> | I   | *4              | *4                | *4                       | *4 | *4            | *4   | *4  | *4  | *4     | *4     | *4             |

\*1 25 Hz pulse with 50% duty cycle. Synchronized with rotation of drum.

\*2 Normal PB “L”. V period “H” pulse when x1.

\*3 V period “H” pulse.

\*4 Composite sync signal (positive polarity).

5-2. SYSTEM CONTROL – SERVO PERIPHERAL CIRCUIT INTERFACE (MA-402 BOARD IC101)

| Signal   | Pin No.                          | I/O | STOP | FF   | REW  | TAPE<br>THREADING | TAPE<br>UNTHREAD-<br>ING | PB   | PB •<br>PAUSE | SLOW | x 2  | CUE  | REVIEW | RECORD | REC •<br>PAUSE |
|----------|----------------------------------|-----|------|------|------|-------------------|--------------------------|------|---------------|------|------|------|--------|--------|----------------|
| CAP QR   | MA-402<br>IC101 <sup>(91)</sup>  | O   | Hi-Z | Hi-Z | Hi-Z | Hi-Z              | Hi-Z                     | Hi-Z | Hi-Z          | *2   | Hi-Z | Hi-Z | Hi-Z   | Hi-Z   | Hi-Z           |
| DRUM PG  | MA-402<br>IC101 <sup>(104)</sup> | I   | *3   | *1   | *1   | *4                | *4                       | *1   | *1            | *1   | *1   | *1   | *1     | *1     | *1             |
| DRUM FG  | MA-402<br>IC101 <sup>(103)</sup> | I   | *3   | *6   | *6   | *4                | *4                       | *6   | *6            | *6   | *6   | *6   | *6     | *6     | *6             |
| CAP FG   | MA-402<br>IC101 <sup>(9)</sup>   | I   | H/L  | *5   | *5   | *4                | *4                       | *5   | H/L           | *5   | *5   | *5   | *5     | *5     | H/L            |
| CAP PWM  | MA-402<br>IC101 <sup>(108)</sup> | O   | *7   | *7   | *7   | *7                | *7                       | *8   | *7            | *7   | *8   | *8   | *8     | *8     | *7             |
| DRUM PWM | MA-402<br>IC101 <sup>(107)</sup> | O   | *9   | *9   | *9   | *9                | *9                       | *9   | *9            | *9   | *9   | *9   | *9     | *9     | *9             |

\*1. 25 Hz (PAL), 30 Hz (NTSC) pulse.

\*2. Pulse at tape running.

\*3. “L” when drum rotation stop.

\*4. Unstable period pulse.

\*5. Pulse of period in proportion to tape speed.

\*6. 300 Hz (PAL), 360 Hz (NTSC) pulse.

\*7. Pulse at tape running.

\*8. Approx. 2 msec period “H” or “L” pulse.

\*9. Approx. 1.5 msec period “H” or “L” pulse.

### 5-3. SYSTEM CONTROL – MECHANISM BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal  | Pin No.                         | I/O        | EJECTED | CASSETTE<br>LOADING | CASSETTE<br>UNLOADING | TAPE<br>THREAD-<br>ING | TAPE<br>UNTHREAD-<br>ING | STOP | FF | REW | PB | PB<br>PAUSE | SLOW | x 2 | CUE | REVIEW | REC | REC •<br>PAUSE |
|---------|---------------------------------|------------|---------|---------------------|-----------------------|------------------------|--------------------------|------|----|-----|----|-------------|------|-----|-----|--------|-----|----------------|
| CAM     | MA-402<br>IC101 <sup>(45)</sup> | O          | Hi-Z    | H                   | L                     | H                      | L                        | H    | *7 | *7  | *7 | *7          | *7   | *7  | *7  | *7     | *7  | *7             |
| MODE 1  | MA-402<br>IC101 <sup>(37)</sup> | I          | H       | L                   | L                     | *1                     | *1                       | L    | H  | H   | H  | H           | H    | H   | H   | L      | H   | H              |
| MODE 2  | MA-402<br>IC101 <sup>(38)</sup> | I          | H       | L                   | L                     | *1                     | *1                       | L    | H  | H   | H  | H           | H    | L   | L   | L      | L   | L              |
| MODE 3  | MA-402<br>IC101 <sup>(39)</sup> | I          | L       | L                   | L                     | *1                     | *1                       | L    | L  | L   | L  | L           | L    | L   | L   | H      | L   | L              |
| MODE 4  | MA-402<br>IC101 <sup>(40)</sup> | I          | L       | H                   | H                     | *1                     | *1                       | H    | H  | H   | H  | H           | H    | L   | L   | L      | L   | L              |
| REC PRF | MA-402<br>IC101 <sup>(86)</sup> | I          | H       | *2                  | *2                    | *2                     | *2                       | *2   | *2 | *2  | *2 | *2          | *2   | *2  | *2  | *2     | *2  | *2             |
| T REEL  | MA-402<br>IC101 <sup>(42)</sup> | I          | H/L     | H/L                 | H/L                   | H/L                    | H/L                      | H/L  | *3 | *3  | *3 | H/L         | *3   | *3  | *3  | *3     | *3  | H/L            |
| S RELL  | MA-402<br>IC101 <sup>(41)</sup> | I          | H/L     | H/L                 | H/L                   | *3                     | *3                       | H/L  | *3 | *3  | *3 | H/L         | *3   | *3  | *3  | *3     | *3  | H/L            |
| END-LED | MA-402<br>IC101 <sup>(49)</sup> | O<br>(O.D) | *4      | *4                  | *4                    | *4                     | *4                       | *4   | *4 | *4  | *4 | *4          | *4   | *4  | *4  | *4     | *4  | *4             |
| CAP PVS | MA-402<br>IC101 <sup>(90)</sup> | I          | L       |                     |                       | H                      | L                        | H/L  | H  | L   | H  | H           | H    | H   | H   | L      | H   | H              |
| T SENS  | MA-402<br>IC101 <sup>(33)</sup> | I          | *4      | *4                  | *4                    | *6                     | *6                       | *4   | *6 | *6  | *6 | *6          | *6   | *6  | *6  | *6     | *6  | *6             |
| S SENS  | MA-402<br>IC101 <sup>(32)</sup> | I          | *4      | *4                  | *4                    | *6                     | *6                       | *4   | *6 | *6  | *6 | *6          | *6   | *6  | *6  | *6     | *6  | *6             |

\*1. Uncertainty.

\*2. "L" when erasing protection tab is bent, "H" when not bent.

\*3. Pulse of period in proportion to reel rotating speed.

\*4. Approx.2 msec period "H" pulse.

\*5. Pulse at tape running.

\*6. Normally "L". 2 msec period "H" pulse when tape top or tape end is detected.

\*7. When transition to UNLOADING direction: L.

When Transition to LOADING direction: H.

When CAM motor is stopped: Hi-Z.

5-4. SYSTEM CONTROL – AUDIO BLOCK INTERFACE (MA-402 BOARD IC101)

| Signal     | Pin No.                          | I/O        | STOP/<br>FF/<br>REW                                          | TAPE<br>THREAD-<br>ING | TAPE<br>UNTHREAD-<br>ING | PB   | PB •<br>PAUSE | SLOW | x 2 | CUE | REVIEW | REC | REC •<br>PAUSE |
|------------|----------------------------------|------------|--------------------------------------------------------------|------------------------|--------------------------|------|---------------|------|-----|-----|--------|-----|----------------|
| AU RF      | MA-402<br>IC101 <sup>(35)</sup>  | O          | AF RF envelope signal input terminal for automatic tracking. |                        |                          |      |               |      |     |     |        |     |                |
| A MUTE     | MA-402<br>IC101 <sup>(39)</sup>  | O<br>(O.D) | Hi-Z                                                         | Hi-Z                   | Hi-Z                     | Hi-Z | H             | H    | H   | H   | H      | H   | H              |
| AF SWP     | MA-402<br>IC101 <sup>(106)</sup> | O          | *1                                                           | *1                     | *1                       | *1   | *1            | *1   | *1  | *1  | *1     | *1  | *1             |
| FULL ERASE | MA-402<br>IC101 <sup>(71)</sup>  | O<br>(O.D) | H                                                            | H                      | H                        | H    | H             | H    | H   | H   | H      | L   | H              |
| REC P      | MA-402<br>IC101 <sup>(72)</sup>  | O          | L                                                            | L                      | L                        | L    | L             | L    | L   | L   | L      | H   | L              |
| NAPB       | MA-402<br>IC101 <sup>(98)</sup>  | O          | L                                                            | L                      | L                        | L    | L             | L    | L   | L   | L      | H   | L              |

\*1. 25Hz (PAL), 30Hz (NTSC) 50% duty pulse approx. 5 msec delayed from RF SW P.

## 5-5. SERVO/SYSTEM CONTROL, OSD MICROPROCESSOR PIN FUNCTION (MA-402 BOARD IC101)

| Pin No. | Pin Name           | I/O | Function                                   |
|---------|--------------------|-----|--------------------------------------------|
| 1       | VSS (SERVO)        | —   | Servo ground                               |
| 2       | AN GND             | —   | Analog ground                              |
| 3       | CTL(+)             | I/O | CTL Head signal input/output (REC mode)    |
| 4       | CTL (—)            | I/O | CTL Head signal input/output (REC mode)    |
| 5       | CTL-BIAS           | I   | CTL amp. control signal input (gain set)   |
| 6       | CTL-FB             | I   | CTL amp. control signal input (gain set)   |
| 7       | CTL-AMP(O)         | O   | CTL amp. control signal input (for check)  |
| 8       | CTL-SMT            | I   | CTL amp. control signal input (gain set)   |
| 9       | CAP FG             | I   | Capstan FG schmitt input                   |
| 10      | VCC (SERVO)        | —   | Power supply unswitch 5V                   |
| 11      | AFC PC             | I/O | AFC oscillation signal                     |
| 12      | AFC OSC            | I/O | AFC oscillation signal                     |
| 13      | AFCLPF             | I/O | AFC LPF signal                             |
| 14      | HSYNC              | I/O | Horizontal sync signal                     |
| 15      | VSYSN              | I   | V sync signal input                        |
| 16      | C V IN 2           | I   | Composite video signal input 2             |
| 17      | C V IN 1           | I   | Composite video signal input 1             |
| 18      | OSDVSS             |     | Power supply OSD 5V                        |
| 19      | VIDEO OUT (CV OUT) | O   | Composite video signal output              |
| 20      | OSD VSS            | —   | OSD ground                                 |
| 21      | 4FSC OUT           | O   | OSC 4fsc oscillator terminal signal output |
| 22      | 4Fsc IN            | I   | OSC 4fsc oscillator terminal signal input  |
| 23      | AVSS               | —   | Analog ground                              |
| 24      | APC Error          | I   | APC error voltage signal input             |
| 25      | TU AFT             | I   | Auto tuning signal input                   |
| 26      | FUNCTION Key 2     | I   | Function key analog voltage signal input 2 |
| 27      | FUNCTION Key 1     | I   | Function key analog voltage signal input 2 |
| 28      | POWER FAIL         | I   | Power failure detect signal input          |
| 29      | DEST 1             | I   | Destination set signal input 1             |
| 30      | PB                 | —   | Not used                                   |
| 31      | DEST 2             | I   | Destination set signal input 2             |
| 32      | T SENS             | I   | Take up end sensor signal input            |
| 33      | S SENS             | I   | Supply end sensor signal input             |
| 34      | VIDEO RF           | I   | Video RF envelope signal                   |
| 35      | AUDIO RF           | I   | Audio RF envelope signal                   |
| 36      | AVCC               | —   | Analog power supply                        |
| 37      | MODE1              | I   | Mechanism Section CAM encoder data input 1 |
| 38      | MODE2              | I   | Mechanism Section CAM encoder data input 2 |
| 39      | MODE3              | I   | Mechanism Section CAM encoder data input 3 |
| 40      | MODE4              | I   | Mechanism Section CAM encoder data input 4 |
| 41      | S REEL             | I   | S side reel FG input                       |
| 42      | T REEL             | I   | T side reel FG input                       |
| 43      | REMOCON            | I   | Remote Control (SIRCS) signal input        |
| 44      | CTL-OSD            | I/O | CTL amp. signal input/output (OSD)         |
| 45      | CAM                | O   | CAM motor signal output                    |
| 46      | SAT SYNC LED       | —   | Not used                                   |
| 47      | RR LED             | —   | Not used                                   |
| 48      | SEARCH LED         | —   | Not used                                   |
| 49      | END LED            | O   | Top/end LED on/off control signal output   |
| 50      | POWER CONT         | O   | Power supply control signal output         |
| 51      | WRITE CONT         | O   | EEP ROM write timing control signal output |
| 52      | BLUE BACK          | O   | OSD block control output                   |
| 53      | AUDIO DUB          | O   | To 'on' the audio dub filter               |
| 54      | ETR 1              | I   | Easy Timer knob pulse 1 signal input       |
| 55      | ETR 2              | I   | Easy Timer knob pulse 2 signal input       |
| 56      | VCC                | I   | Power supply                               |

| Pin No. | Pin Name           | I/O | Function                                                   |
|---------|--------------------|-----|------------------------------------------------------------|
| 57      | VSS                | —   | Ground                                                     |
| 58      | FLD VSS            | —   | FLD ground                                                 |
| 59      | SCL0               | I/O | Clock signal input/output                                  |
| 60      | SDA0               | I/O | Data input/output for IIC                                  |
| 61      | SCL1               | I/O | Clock input/output for IIC bus interface                   |
| 62      | SDA1               | I/O | Data input/output for IIC bus interface                    |
| 63      | SCK1               | I/O | SCI clock input/output                                     |
| 64      | SO1                | O   | Serial communication data signal output                    |
| 65      | SI1                | I   | Serial communication data signal input                     |
| 66      | OSD MIX            | O   | To 'on/off' mesecam filter                                 |
| 67      | PAL                | O   | To control the de-emphasise                                |
| 68      | SW2                | O   | Tuner system control 2 signal output                       |
| 69      | SW1                | O   | Tuner system control 2 signal output                       |
| 70      | SECAM ON           | —   | Not used (only for secam model)                            |
| 71      | FULL ERASE         | O   | Full erase head on/off control signal                      |
| 72      | REC P              | O   | "L" : output when REC pause                                |
| 73      | IN SELECT          | O   | Line-input selection control signal output                 |
| 74      | FLASH WRITE ENABLE | I   | Enables flash write                                        |
| 75      | 32KHZ (OUT)        | O   | Timer clock terminal (32khz) output                        |
| 76      | 32KHZ (IN)         | I   | Timer clock terminal (32khz) input                         |
| 77      | RESET              | I   | Reset signal output                                        |
| 78      | 10MHZ (IN)         | I   | System clock terminal (10MHz) input                        |
| 79      | VSS                | —   | Ground                                                     |
| 80      | 10MHZ (OUT)        | O   | System clock terminal (10MHz) input                        |
| 81      | CAP CONNET TO VSS  | —   | Smoothing capacitor connection                             |
| 82      | MDO                | I   | Sets operating mode                                        |
| 83      | TV/VTR             | —   | Not used                                                   |
| 84      | APC PWM            | O   | APC PWM signal output                                      |
| 85      | CAP TRQ PWM        | O   | Capstan TRQ PWM signal output                              |
| 86      | REC PROOF          | I   | Erasing protection tab. Cassette in detection signal input |
| 87      | NIL                | —   | Not used                                                   |
| 88      | NIL                | —   | Not used                                                   |
| 89      | A MUTE             | O   | "H" : audio mute signal output                             |
| 90      | CAP RVS            | O   | Capstan reverse control signal "H": when reverse           |
| 91      | CAP QR             | O   | Capstan step driving signal output                         |
| 92      | DRUM QR            | O   | Drum motor step driving signal output                      |
| 93      | PLL CLOCK          | O   | Tuner PLL clock signal output                              |
| 94      | TU ENABLE          | O   | Tuner PLL chip select signal output                        |
| 95      | PLL DATA           | O   | Tuner PLL data signal output                               |
| 96      | NA PB              | O   | Normal audio PB signal output                              |
| 97      | AF REC P           | O   | "L": output when Hi-Fi audio REC pause (not used)          |
| 98      | EX CTL             | —   | Not used                                                   |
| 99      | SECAM DET          | —   | Not used                                                   |
| 100     | C. KILLER DET      | I   | To detect type of color system                             |
| 101     | HEAD CLOG LED      | —   | Not used                                                   |
| 102     | MESECAM DET        | I   | To detect mesecam signal                                   |
| 103     | DRUM PG            | I   | Drum FG schmitt amp. input                                 |
| 104     | DRUM FG            | I   | Drum FG schmitt amp. put                                   |
| 105     | RF SWP             | O   | RF switching pulse signal output                           |
| 106     | AF SWP             | O   | AF switching pulse signal output                           |
| 107     | DRUM PWM           | O   | Drum motor error signal output                             |
| 108     | CAP PWM            | O   | Capstan error signal output                                |
| 109     | QVD                | O   | Quasi VD pulse signal output                               |
| 110     | VSS                | —   | Ground                                                     |
| 111     | CSYNC              | I   | Composite sync signal input                                |
| 112     | VCC                | —   | Power supply unswitch 5V                                   |

## 5-6. NICAM PROCESSOR PIN FUNCTION (NK-11 BOARD IC1)

| Pin. No. | Pin Name | I/O | Function                                                                        |
|----------|----------|-----|---------------------------------------------------------------------------------|
| 1        | OUT L    | O   | Analog signal output left                                                       |
| 2        | OUT R    | O   | Analog signal output right                                                      |
| 3        | VDD A1   | –   | Analog power supply 5V; DAC circuitry                                           |
| 4        | VSS A1   | –   | Analog ground; DAC circuitry                                                    |
| 5        | VSS D1   | –   | Digital ground; DAC circuitry                                                   |
| 6        | VDD D1   | –   | Digital power supply 5V; DAC circuitry                                          |
| 7        | VSS D2   | –   | Digital ground; DSP part                                                        |
| 8        | VDD D2   | –   | Digital power supply 5V; DSP part                                               |
| 9        | TP2      | I   | Additional test pin 2; connected to ground for normal operation                 |
| 10       | N.C.     | –   | Not used                                                                        |
| 11       | TP1      | I   | Additional test pin 1; connected to ground for normal operation                 |
| 12       | N.C.     | –   | Not used                                                                        |
| 13       | N.C.     | –   | Not used                                                                        |
| 14       | V TUNE   | O   | Tuning voltage output for crystal oscillator                                    |
| 15       | XTAL I   | I   | Crystal oscillator input                                                        |
| 16       | XTAL O   | O   | Crystal oscillator output                                                       |
| 17       | TEST2    | I   | Test pin 2; connected to ground for normal operation                            |
| 18       | I REF    | I   | Resistor for reference current generation; front end circuitry                  |
| 19       | N.C.     | –   | Not used                                                                        |
| 20       | VSS A2   | –   | Analog ground; analog front end circuitry                                       |
| 21       | VDD A2   | –   | Analog power supply 5V; analog front end circuitry                              |
| 22       | TEST1    | I   | Test pin 1; connected to ground for normal operation                            |
| 23       | SIF2     | I   | Sound IF input 2                                                                |
| 24       | V REF1   | I   | Reference voltage; analog front end circuitry                                   |
| 25       | SIF1     | I   | Sound IF input 1                                                                |
| 26       | C RST    |     | Capacitor for power-on reset                                                    |
| 27       | VSS D3   | –   | Digital ground; front end circuitry                                             |
| 28       | VDD D3   | –   | Digital power supply 5V; front end circuitry                                    |
| 29       | SCL      | I   | Serial communication clock signal input                                         |
| 30       | SDA      | I   | Serial communication data signal input                                          |
| 31       | N.C.     | –   | Not used                                                                        |
| 32       | N.C.     | –   | Not used                                                                        |
| 33       | N.C.     | –   | Not used                                                                        |
| 34       | N.C.     | –   | Not used                                                                        |
| 35       | VDD D4   | –   | Digital power supply 5V; demodulator circuitry                                  |
| 36       | VSS D4   | –   | Digital ground; demodulator circuitry                                           |
| 37       | N.C.     | –   | Not used                                                                        |
| 38       | N.C.     | –   | Not used                                                                        |
| 39       | EXTI R   | I   | External audio input right channel                                              |
| 40       | EXTI L   | I   | External audio input left channel                                               |
| 41       | V REF2   | I   | Analog reference voltage digital-to-analog converter and operational amplifiers |
| 42       | N.C.     | –   | Not used                                                                        |
| 43       | VDD A3   | –   | Analog power supply 5V; operational amplifiers                                  |
| 44       | VSS A3   | –   | Analog ground; operational amplifiers                                           |

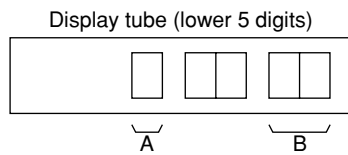
## 5-7. ZWEITON PROCESSOR PIN FUNCTION (GK-12 BOARD IC001)

| Pin. No. | Pin Name | I/O | Function                                                                        |
|----------|----------|-----|---------------------------------------------------------------------------------|
| 1        | OUT L    | O   | Audio left signal output                                                        |
| 2        | OUT R    | O   | Audio right signal output                                                       |
| 3        | CDE1     | –   | De-emphasis 1 capacitor                                                         |
| 4        | N.C.     | –   | Not used                                                                        |
| 5        | N.C.     | –   | Not used                                                                        |
| 6        | CDE2     | –   | De-emphasis 2 capacitor                                                         |
| 7        | A GND    | –   | Analog ground                                                                   |
| 8        | AF1 I    | I   | Audio 1 signal input                                                            |
| 9        | N.C.     | –   | Not used                                                                        |
| 10       | AF1 O    | O   | Audio 1 signal output                                                           |
| 11       | N.C.     | –   | Not used                                                                        |
| 12       | N.C.     | –   | Not used                                                                        |
| 13       | AFR      | I   | AF 1/2 signal return                                                            |
| 14       | LF1      | –   | Loop filter 1                                                                   |
| 15       | XTAL     | I   | 4MHz reference input                                                            |
| 16       | N.C.     | –   | Not used                                                                        |
| 17       | N.C.     | –   | Not used                                                                        |
| 18       | LF2      | –   | Loop filter 2                                                                   |
| 19       | N.C.     | –   | Not used                                                                        |
| 20       | N.C.     | –   | Not used                                                                        |
| 21       | MAD      | I   | Programmable address bit (module address)                                       |
| 22       | N.C.     | –   | Not used                                                                        |
| 23       | N.C.     | –   | Not used                                                                        |
| 24       | CAF1     | O   | AF1 capacitor                                                                   |
| 25       | IF INT   | I   | IF intercarrier input                                                           |
| 26       | CAF2     | O   | AF2 capacitor                                                                   |
| 27       | D GND    | –   | Digital ground                                                                  |
| 28       | VCC      | –   | Power supply 5V                                                                 |
| 29       | SCL      | I   | Serial communication clock input                                                |
| 30       | SDA      | I/O | Serial communication data input and output                                      |
| 31       | LPF      | –   | Pilot loop filter                                                               |
| 32       | AF2 O    | O   | Audio 2 signal output                                                           |
| 33       | AF2 I    | I   | Audio 2 signal input                                                            |
| 34       | CTR IG   | –   | Trigger capacitor                                                               |
| 35       | CID      | –   | Identification capacitor                                                        |
| 36       | N.C.     | –   | Not used                                                                        |
| 37       | P1       | O   | Output port 1                                                                   |
| 38       | EXT M    | I   | External audio input monaural channel                                           |
| 39       | EXTI R   | I   | External audio input right channel                                              |
| 40       | EXTI L   | I   | External audio input left channel                                               |
| 41       | V REF    | I   | Analog reference voltage digital-to-analog converter and operational amplifiers |
| 42       | P2       | O   | Output port 2                                                                   |
| 43       | OUT M    | O   | Audio monaural signal output                                                    |
| 44       | N.C.     | –   | Not used                                                                        |

## SECTION 6

### ERROR CODE

This set displays an error code, and a mode code in case of error on the display tube, if the operation stopped by error. The following provides description concerned.



A: Error code ..... Table 6-1  
B: Mode code in case of error ..... Table 6-2

These codes are displayed at lower 5-digit positions of display tube.

In this case, “:” between digits is not displayed.

**Table 6-1. Error Codes**

| Code | Description                         |
|------|-------------------------------------|
| 0    | NO ERROR                            |
| 1    | CAM ENCODER ERROR, LOAD DIRECTION   |
| 2    | CAM ENCODER ERROR, UNLOAD DIRECTION |
| 3    | T REEL ERROR                        |
| 4    | S REEL ERROR                        |
| 5    | CAPSTAN ERROR                       |
| 6    | DRUM ERROR                          |
| 7    | INITIALIZE ERROR                    |
| 8    | CASSETTE UNLOADING ERROR            |
| 9    | RESERVED                            |

**Table 6-2. Mode Codes in Case of Error**

| Code | Description                   |
|------|-------------------------------|
| 0    | EJECT (POWER ON)              |
| 1    | EJECT (POWER OFF)             |
| 2    | UNLOAD STOP                   |
| 3    | STOP (POWER ON)               |
| 4    | POWER OFF (CASSETTE IN)       |
| 5    | F. FWD                        |
| 6    | REW                           |
| 7    | LOW SPEED F. FWD              |
| 8    | LOW SPEED REW                 |
| 9    | STANDBY                       |
| 10   | REC                           |
| 11   | REC (VISS)                    |
| 12   | REC PAUSE                     |
| 13   | PLAY                          |
| 14   | A. DUB                        |
| 15   | A. DUB PAUSE                  |
| 16   | CUE                           |
| 17   | REV                           |
| 18   | STILL (MECHA FWD)             |
| 19   | FWD FRAME BY FRAME (FWD SLOW) |
| 20   | STILL (MECHA RVS)             |
| 21   | RVS FRAME BY FRAME (RVS SLOW) |

SECTION 7  
ADJUSTMENTS

During the adjustment, see the Parts Arrangement Diagram for Adjustments on Page 7-6.

7-1. MECHANICAL ADJUSTMENTS

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

7-2. ELECTRICAL ADJUSTMENTS

2-1. PRE-ADJUSTMENT PREPARATIONS

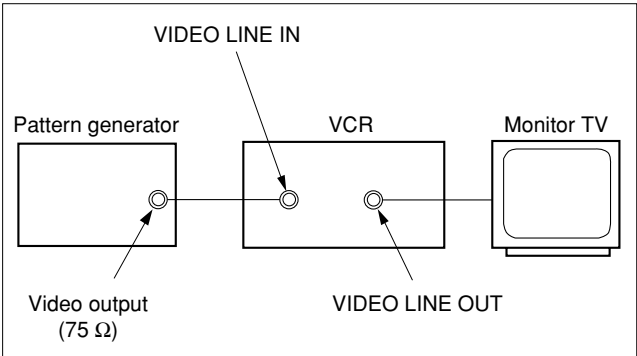
Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

2-1-1. Instruments to be Used

- 1) Color TV
- 2) Oscilloscope 1 or 2 phenomena, band more than 30 MHz, delay mode, as provided.
- 3) NTSC pattern generator
- 4) PAL pattern generator
- 5) Digital voltmeter
- 6) Audio level meter
- 7) Audio noise meter
- 8) Audio generator
- 9) Attenuator
- 10) Alignment tape
  - Part Code: 8-192-605-36 KRV-51P (PAL)
  - Part Code: 8-192-605-32 KRV-51N2 (NTSC)

2-1-2. Connection

Unless otherwise specified, connect and adjust the measuring



instruments as shown in the following diagram.

Fig. 7-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL or NTSC pattern generator is connected with LINE input signal terminal. When checking with tuner, connected AERIAL terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3 V, respectively, and that the level ratio of the burst signal and “red” signal are 0.30: 0.66. Fig. 7-2-2. shows video signals (color bars) used in adjusting the video section.

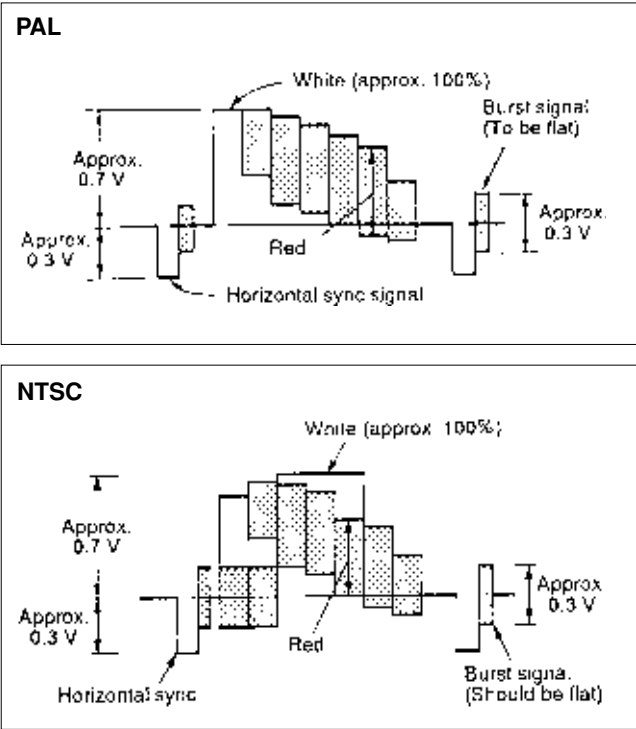


Fig. 7-2-2

2-1-4. Alingment Tapes

[Alignment Tape (KRV-51N2/KRV-51P)]

|   | Mode | Time          | Video signal | Audio signal<br>(HiFi/Normal) |
|---|------|---------------|--------------|-------------------------------|
| 1 | SP   | Seven minutes | Color bar    | 400 Hz                        |
| 2 | SP   | Three minutes | Monoscope    |                               |
| 3 | EP   | Seven minutes | Color bar    |                               |
| 4 | EP   | Three minutes | Monoscope    |                               |

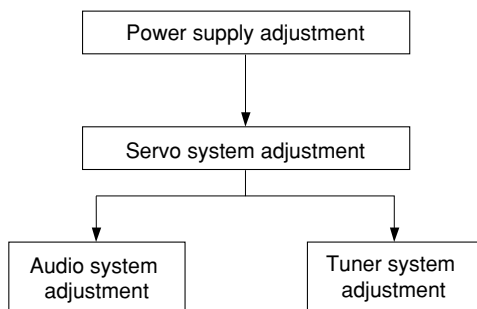
2-1-5. Specified I/O Level and Impedance

Input/output terminal

- Video inputs  
LINE IN : phono jack  
1 Vp-p, 75 Ω, unbalanced, sync negative
- Audio inputs  
LINE IN : phono jacks  
47 kW, -7.5 dBs (0 dBs = 0.775 Vrms)  
More than 10 kW, -4 dBs
- Video outputs  
LINE OUT: phono jack  
1 Vp-p, 75 Ω, unbalanced, sync negative
- Audio outputs  
LINE OUT: phono jacks  
-7.5 dBs at load impedance 47 kW  
Output impedance : less than 10 Ω

### 2-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



## 2-2. POWER SUPPLY ADJUSTMENT

### 2-2-1. Power Supply Check

|                      |                                     |
|----------------------|-------------------------------------|
| Mode                 | E-E                                 |
| Measuring Instrument | Digital voltmeter                   |
| +F, -F check         |                                     |
| Measurement Point    | Between JL 615 (IF) and JL 614 (-F) |
| Specified Value      | $3.0 \pm 1.0$ V                     |
| -13 V check          |                                     |
| Measurement Point    | JL 625                              |
| Specified Value      | $-11.0 \pm 1.5$ V                   |
| +6 V check           |                                     |
| Measurement Point    | JL 611                              |
| Specified Value      | $5.95 \pm 0.3$ V                    |
| +13 V check          |                                     |
| Measurement Point    | JL 604                              |
| Specified Value      | $13.5 \pm 1.0$ V                    |
| +38 V check          |                                     |
| Measurement Point    | JL 618                              |
| Specified Value      | $32.0 \pm 4.0$ V                    |

#### Checking Method:

- 1) Confirm that each voltage meets its specified value.

## 2-3. SERVO SYSTEM ADJUSTMENT

### 2-3-1. RF Switching Position Adjustment (MA-402 BOARD)

#### Purpose:

Adjust the interval between A ch and B ch of tape playback output. Improve the interchangeability with other tapes and sets.

When it is out of order, the interval appears on the screen, the screen is disturbed.

| Mode                 | PB                                                                                                    |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Signal               | Alignment tape SP mode color bar                                                                      |
| Measurement Point    | CH1: Pin ② of CN202<br>CH2: Pin ③ of CN202 (RF SWP)                                                   |
| Measuring Instrument | Oscilloscope                                                                                          |
| Specified Value      | $6.5 \pm 0.5$ H ( $416 \pm 32$ $\mu$ sec)<br>PAL<br>$6.5 \pm 0.5$ H ( $410 \pm 32$ $\mu$ sec)<br>NTSC |

#### Adjusting Method:

- 1) Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
- 2) Check appear "A P" on FL display.
- 3) Using the channel + and - buttons, adjust to  $6.5 \pm 0.5$  H.
- 4) Press the pause button.

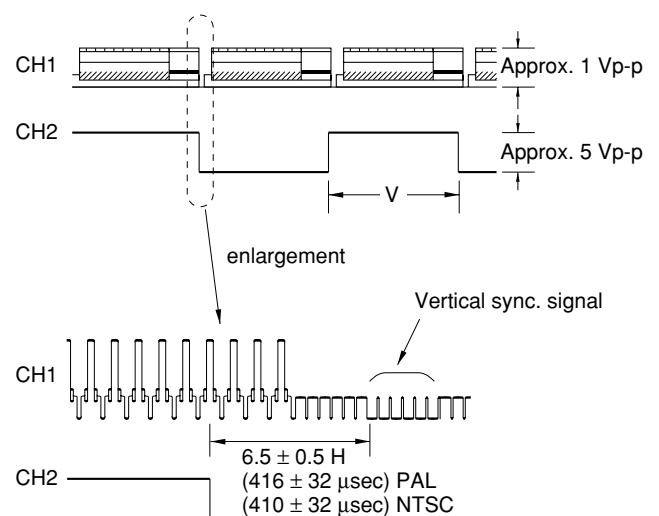


Fig. 7-2-3.

## 2-4. AUDIO SYSTEM ADJUSTMENTS

- Adjust both Lch and Rch.

### [Connection]

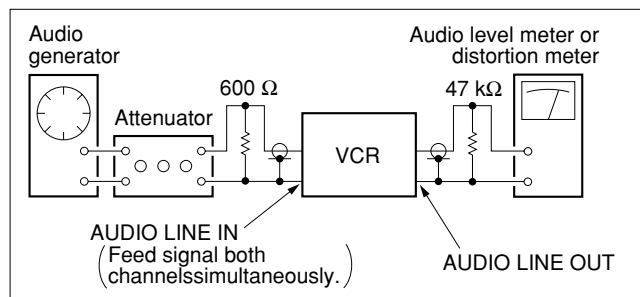


Fig. 7-2-4.

### 2-4-1. Hi-Fi Audio System Adjustment (SLV-ED815/ED817/ED818/ED915/EZ715/EZ717)

- Set switches and knobs to the following positions to make adjustment unless otherwise specified.

INPUT SELECT switch ..... LINE

AUDIO MONITOR ..... STEREO

### [Adjustment Sequence]

- AF Switching Position Adjustment
- Frequency Response Check
- Overall Level Characteristic and Distortion Factor Check
- Overall S/N Check

#### 1. AF Switching Position Adjustment (MA-402 BOARD)

##### Purpose:

Adjust the interval between A CH and B CH of tape playback output. Improve the interchangeability with other tapes and sets.

When it is out of order, noisy sound is increased and big noise is heard.

| Mode                 | PB                                         |
|----------------------|--------------------------------------------|
| Signal               | Alignment tape SP mode color bar           |
| Measurement point    | CH1: Pin ③ of CN202<br>CH2: Pin ① of CN202 |
| Measuring Instrument | Oscilloscope                               |
| Specified Value      | Fig. 7-2-5                                 |

##### Adjusting Method:

- Connect MA-402 board JS401 to the GND for about 1 second to activate the RF switching position adjustment mode.
- Press the PLAY button to activate the AF switching position adjustment mode.
- Check appear "A H" on FL display.
- Using the channels + and - buttons, minimize a chipped portion. At this time, confirm that a noisy sound is not heard.
- Press the pause button.

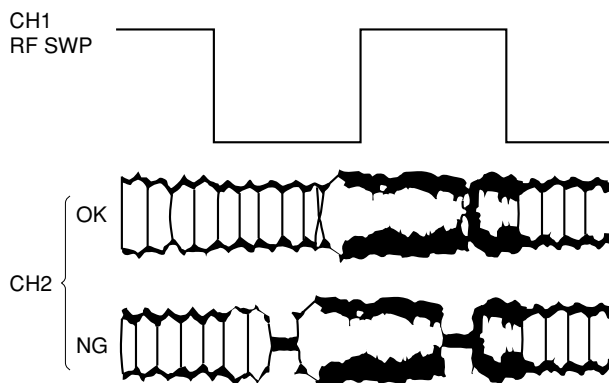


Fig. 7-2-5.

### 2. Frequency Response Check

#### Purpose:

Confirm that the frequency characteristic is within the specification.

| Mode                  | REC and PB (SP, LP mode)                                   |
|-----------------------|------------------------------------------------------------|
| Signal                | 400 Hz, -17.5 dBs<br>20 Hz, -17.5 dBs<br>20 kHz, -17.5 dBs |
| Measurement point     | Audio output terminal                                      |
| Measurement equipment | Audio level meter                                          |
| Specified value       | 0 ± 2 dB                                                   |

**Note:** Tape path adjustment must have been completed.

#### Confirmation Method:

- Supply a signal of 400 Hz, -17.5 dBs to both L and R channels of Audio Line Input.
- Connect the audio level meter to the Audio Line Output.
- Adjust the attenuator so that the audio level meter will indicate -17.5 dBs.
- Make recording.
- Set an audio line input signal to 20 Hz and make recording.
- Set an audio line input signal to 20 kHz and make recording.
- Playback a recorded portion, and measure output levels at 400 Hz and 20 Hz and 20 kHz.
- Confirm that the 20 Hz and 20 kHz playback output level within a range of the 400 Hz playback output level 0 ± 2 dB.

### 3. Overall Level Characteristic and Distortion Factor Check

#### Purpose:

Check the record level, play level, and distortion factor against the reference input.

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| Mode                  | REC and PB (SP mode)                                                |
| Signal                | 400 Hz, -7.5 dBs                                                    |
| Measurement point     | Audio output terminal                                               |
| Measurement equipment | Audio level meter and distortion factor meter                       |
| Specified value       | Playback level: $-7.5 \pm 2.0$ dBs<br>Distortion factor: 1% or less |

#### Confirmation Method:

- 1) Supply an audio signal of 400 Hz, -7.5 dBs simultaneously to both L and R channels of Audio Line Input.
- 2) Make recording
- 3) Play back a recorded portion.
- 4) Confirm that a playback level is  $-7.5 \pm 2.0$  dBs.
- 5) Confirm that a distortion factor is within 1%.

### 4. Overall S/N Check

#### Purpose:

Confirm that the S/N is within the specification.

|                       |                       |
|-----------------------|-----------------------|
| Mode                  | REC and PB (SP mode)  |
| Signal                | Short                 |
| Measurement point     | Audio output terminal |
| Measurement equipment | Audio noise meter     |
| Specified value       | -67.5 dBs or less     |

#### Confirmation Method:

- 1) Connect both L and R channels of audio line input to the GND.
- 2) Start recording.
- 3) Play the recorded part to confirm that the noise is below -67.5 dBs.

### 2-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode, unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

#### [Adjustment Sequence]

1. ACE Head Adjustment
2. E-E Output Level Check
3. Frequency Response Check
4. Overall Level Characteristic and Distortion Factor Check
5. Overall S/N Check

#### 1. ACE Head Adjustment

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI.

#### 2. E-E Output Level Check

(SLV-ED115/ED215/ED313/ED515/ED616/  
EZ111/EZ212/EZ414)

#### Purpose:

Confirm that the output level against the reference input is within the specification.

|                       |                        |
|-----------------------|------------------------|
| Mode                  | E-E                    |
| Signal                | L, R: 400 Hz, -7.5 dBs |
| Measurement point     | Audio output terminal  |
| Measurement equipment | Audio level meter      |
| Specified value       | $-7.5 \pm 2.0$ dBs     |

#### Confirmation Method:

- 1) Simultaneously input a signal of 400 Hz, -7.5 dBs to both L and R channels of Audio Line Input.
- 2) Confirm that the audio output level is  $-7.5 \pm 3.0$  dBs.  
(This level only can appear with mono models)

#### 3. Frequency Response Check

#### Purpose:

Confirm that the frequency characteristic is within the specification.

|                       |                                       |
|-----------------------|---------------------------------------|
| Mode                  | REC and PB (SP mode)                  |
| Signal                | 400 Hz, -17.5 dBs<br>7 kHz, -17.5 dBs |
| Measurement point     | Audio output terminal                 |
| Measurement equipment | Audio level meter                     |
| Specified value       | $0 \pm 4$ dB                          |

Tape path adjustment must have been completed.

#### Confirmation Method:

- 1) Supply a signal of 400 Hz, -17.5 dBs to both L and R channels of Audio Line Input.
- 2) Connect the audio level meter to the Audio Line Output.
- 3) Adjust the attenuator so that the audio level meter will indicate -17.5 dBs.
- 4) Make recording in the SP mode.
- 5) Set an audio line input signal to 7 kHz and make recording.
- 6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
- 7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level  $0 \pm 4$  dB.

#### 4. Overall Level Characteristic and Distortion Factor Check

##### Purpose:

Check the record level, play level, and distortion factor against the reference input.

|                       |                                                                     |
|-----------------------|---------------------------------------------------------------------|
| Mode                  | REC and PB (SP mode)                                                |
| Signal                | 400 Hz, -7.5 dBs                                                    |
| Measurement point     | Audio output terminal                                               |
| Measurement equipment | Audio level meter and distortion factor meter                       |
| Specified value       | Playback level: $-7.5 \pm 4.0$ dBs<br>Distortion factor: 4% or less |

##### Confirmation Method:

- 1) Supply an audio signal of 400 Hz, -7.5 dBs simultaneously to both L and R channels of Audio Line Input.
- 2) Make recording
- 3) Play back a recorded portion.
- 4) Confirm that a playback level is  $-7.5 \pm 4.0$  dBs. (mono audio)
- 5) Confirm that a distortion factor is less than 4%.

#### 5. Overall S/N Check

##### Purpose:

Confirm that the S/N is within the specification.

|                       |                       |
|-----------------------|-----------------------|
| Mode                  | REC and PB (SP mode)  |
| Signal                | Short                 |
| Measurement point     | Audio output terminal |
| Measurement equipment | Audio noise meter     |
| Specified value       | -46.0 dBs or less     |

##### Confirmation Method:

- 1) Connect both L and R channels of audio line input to the GND.
- 2) Start recording.
- 3) Play the recorded part to confirm that the noise is below -46.0 dBs.

## 2-5. TUNER SYSTEM ADJUSTMENT

### [Connection]

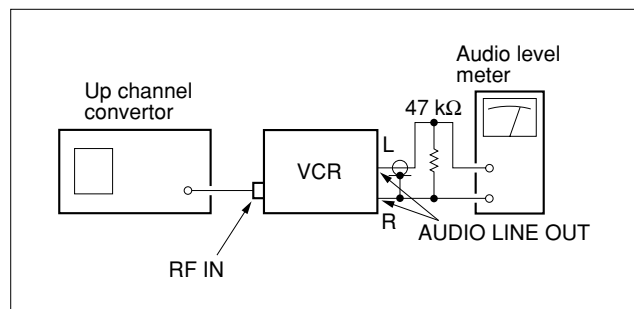


Fig. 7-2-6

### 2-5-1. Separation Adjustment (SLV-EZ715AS/EZ717AS)

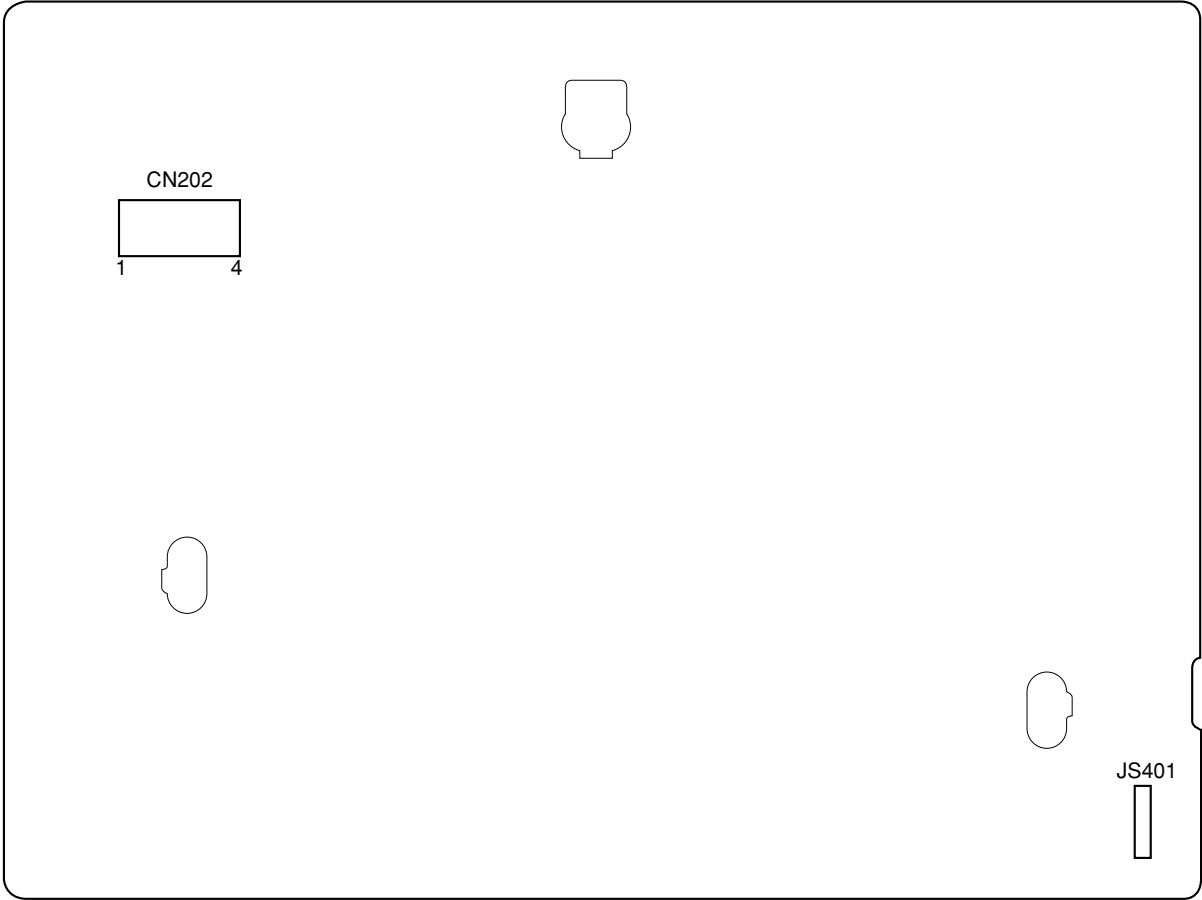
#### Purpose:

Mixed audio signal separate Lch and Rch.

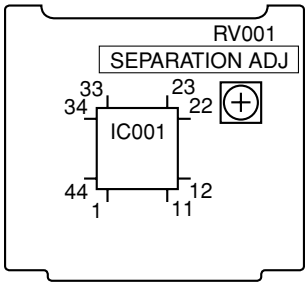
|                       |                                                                                                                                        |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Mode                  | E-E                                                                                                                                    |
| Signal                | VIDEO:<br>color bar<br>(White 100% modulation)<br>AUDIO:<br>L NONE<br>R 1 kHz 60% modulation<br>ELECTRIC FIELD:<br>60-80 dBs/75 Ω Term |
| Measurement point     | Audio output terminal                                                                                                                  |
| Measurement equipment | Audio level meter                                                                                                                      |
| Adjusting Element     | RV001 (GK-12 Board)                                                                                                                    |
| Specified value       | minimum                                                                                                                                |

2-6. PARTS ARRANGEMENT DIAGRAM FOR ADJUSTMENTS

MA-402 BOARD (Side A)



GK-12 BOARD (Side A)



SECTION 8  
REPAIR PARTS LIST

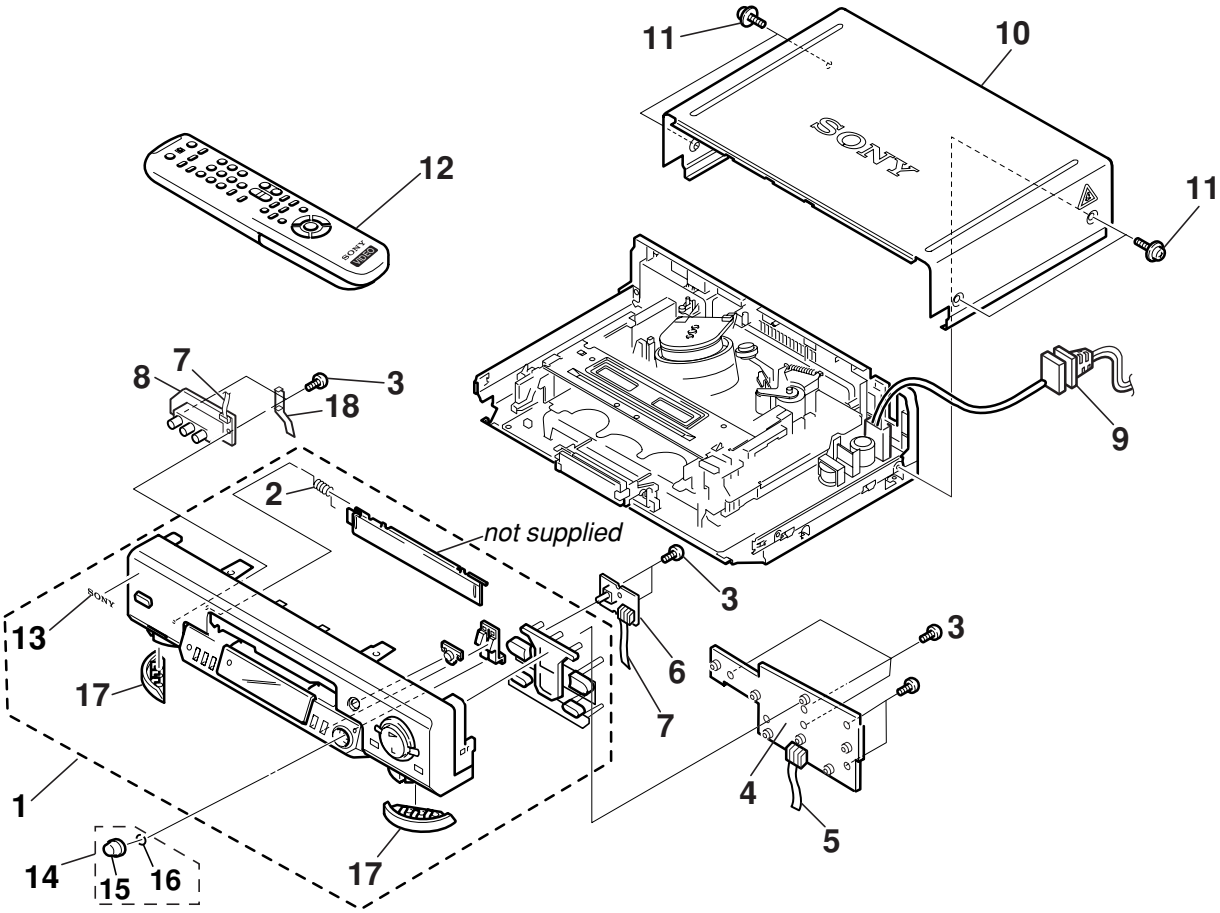
8-1. EXPLODED VIEWS

NOTE:

- XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “\*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

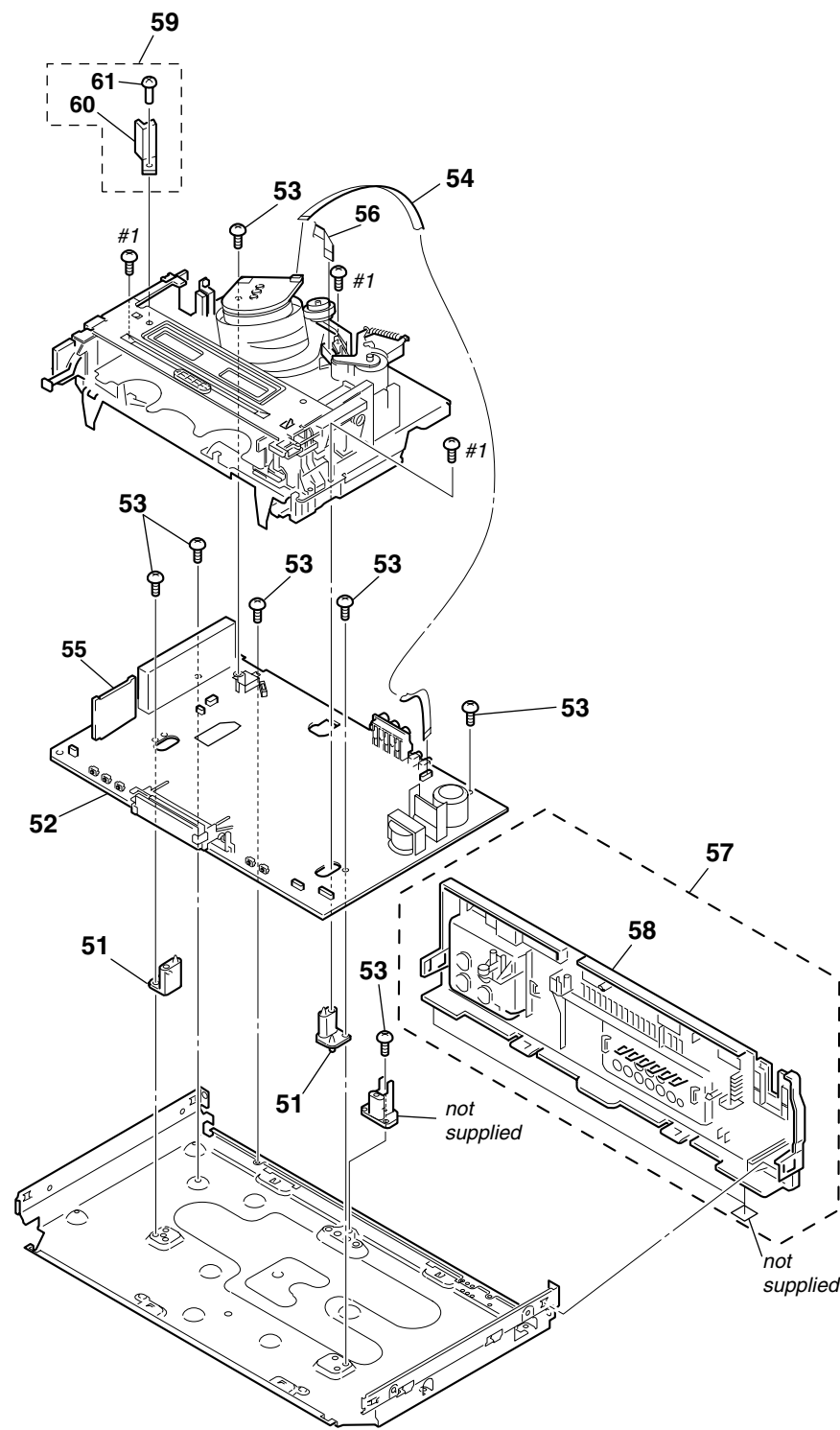
The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  are critical for safety. Replace only with part number specified.

8-1-1. FRONT PANEL AND UPPER CASE SECTION



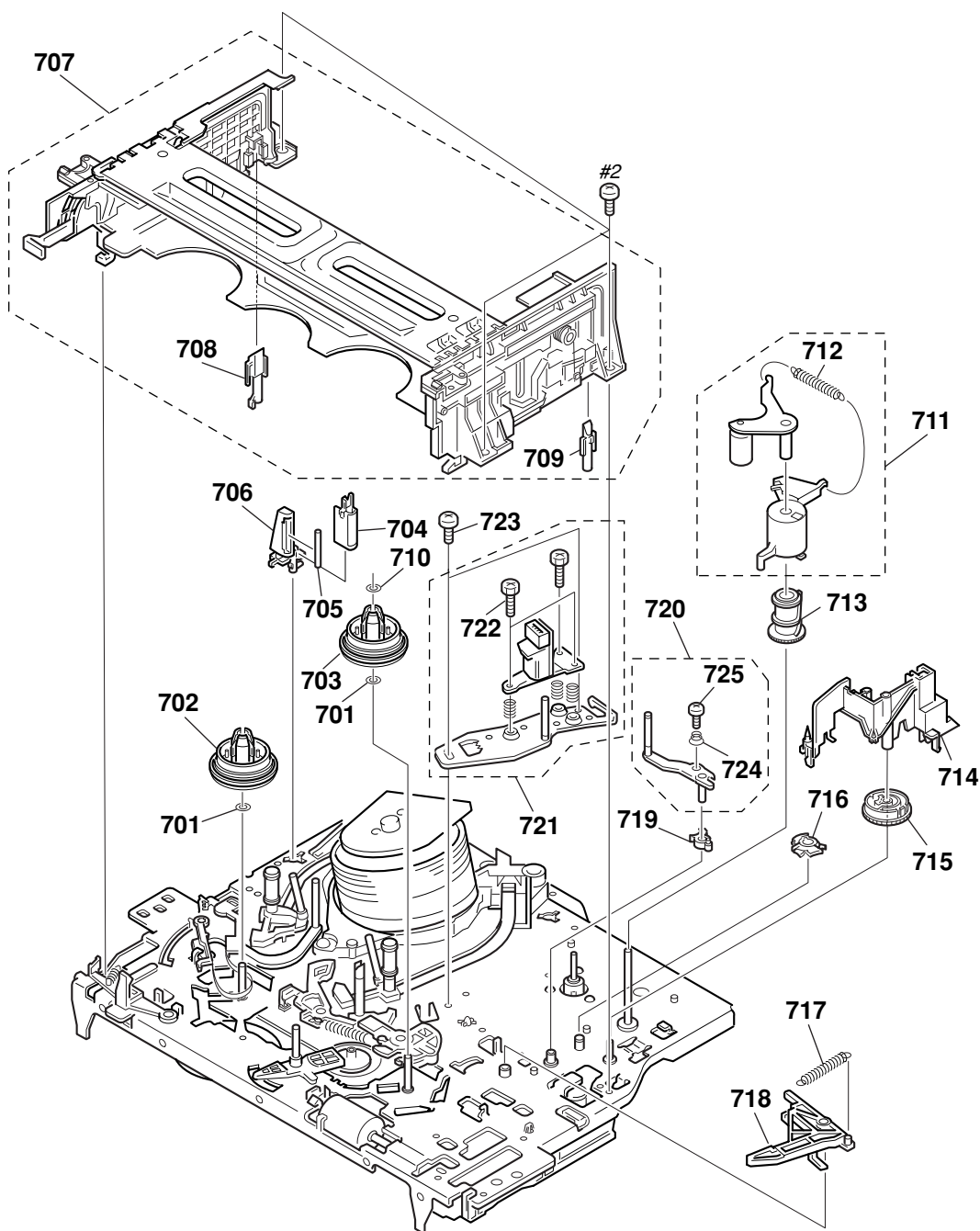
| Ref. No.   | Part No.     | Description                       | Remarks                                                                       | Ref. No. | Part No.     | Description                      | Remarks                                                               |
|------------|--------------|-----------------------------------|-------------------------------------------------------------------------------|----------|--------------|----------------------------------|-----------------------------------------------------------------------|
| 1          | X-3951-336-1 | PANEL ASSY, FRONT (EZ414)         |                                                                               | 10       | 3-064-651-01 | CASE, UPPER (ED313 MJ)           |                                                                       |
| 1          | X-3951-337-1 | PANEL ASSY, FRONT (EZ212)         |                                                                               | 10       | 3-064-651-11 | CASE, UPPER (ED616 MJ)           |                                                                       |
| 1          | X-3951-338-1 | PANEL ASSY, FRONT (EZ111)         |                                                                               | 11       | 3-710-901-11 | SCREW, TAPPING                   | (ED115/ED313/EZ111/EZ212/EZ414)                                       |
| 1          | X-3951-346-1 | PANEL ASSY, FRONT (ED515)         |                                                                               | 11       | 3-710-901-61 | SCREW, TAPPING                   | (ED215/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)         |
| 1          | X-3951-347-1 | PANEL ASSY, FRONT (ED215)         |                                                                               | 12       | 1-476-473-11 | COMMANDER, STANDARD (RMT V-309)  | (EZ717)                                                               |
| 1          | X-3951-348-1 | PANEL ASSY, FRONT (ED115)         |                                                                               | 12       | 1-476-475-11 | COMMANDER, STANDARD (RMT V-311)  | (ED115/ED215/ED313/ED515/ED815)                                       |
| 1          | X-3951-349-1 | PANEL ASSY, FRONT (ED818)         |                                                                               | 12       | 1-476-475-21 | COMMANDER, STANDARD (RMT V-311A) |                                                                       |
| 1          | X-3951-350-1 | PANEL ASSY, FRONT (ED616: ME, SG) |                                                                               | 12       | 1-476-475-31 | COMMANDER, STANDARD (RMT V-311B) | (ED616/ED818)                                                         |
| 1          | X-3951-351-1 | PANEL ASSY, FRONT (ED616 MJ)      |                                                                               | 12       | 1-476-175-41 | COMMANDER, STANDARD (RMT V-311C) | (ED919)                                                               |
| 1          | X-3951-352-1 | PANEL ASSY, FRONT (ED313: ME, SG) |                                                                               | 12       | 1-476-475-51 | COMMANDER, STANDARD (RMT V-311D) | (EZ212/EZ414)                                                         |
| 1          | X-3951-353-1 | PANEL ASSY, FRONT (ED313 MJ)      |                                                                               | 12       | 1-476-475-61 | COMMANDER, STANDARD (RMT V-311E) | (EZ111/EZ715)                                                         |
| 1          | X-3951-354-1 | PANEL ASSY, FRONT (EZ717)         |                                                                               | 13       | 3-943-995-01 | EMBLEM (NO.5), SONY              | (ED115/ED313/EZ111/EZ212/EZ414)                                       |
| 1          | X-3951-355-1 | PANEL ASSY, FRONT (EZ715)         |                                                                               | 13       | 3-943-995-31 | EMBLEM (NO.5), SONY              | (ED215/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)         |
| 1          | X-3951-362-1 | PANEL ASSY, FRONT (ED915)         |                                                                               | 14       | X-3951-233-1 | KNOB ASSY, ETR                   | (ED215/ED515/ED616: ME, SG/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717) |
| 1          | X-3951-363-1 | PANEL ASSY, FRONT (ED919)         |                                                                               | 14       | X-3951-232-1 | KNOB ASSY, ETR                   | (ED115/ED313: ME, SG/EZ111/EZ212/EZ414)                               |
| 1          | X-3951-364-1 | PANEL ASSY, FRONT (ED817)         |                                                                               | 14       | X-3951-464-1 | KNOB ASSY, ETR (ED313 MJ)        |                                                                       |
| 1          | X-3951-365-1 | PANEL ASSY, FRONT (ED815)         |                                                                               | 14       | X-3951-465-1 | KNOB ASSY, ETR (ED616 MJ)        |                                                                       |
| 2          | 3-953-432-01 | SPRING (GE), FL                   |                                                                               | 15       | 3-065-547-31 | KNOB, ETR                        | (ED115/ED313: ME, SG/EZ111/EZ212/EZ414)                               |
| 3          | 4-921-277-41 | SCREW (B2.6 x 8), TAPPING, BIND   |                                                                               | 16       | 3-055-077-1  | SPRING, ETR (P5)                 |                                                                       |
| *          | A-6713-876-A | DM-098 COMPLETE PWB               |                                                                               | 17       | 3-057-164-01 | INSULATOR                        | (ED115/ED313/EZ111/EZ212/EZ414)                                       |
| 5          | 1-757-552-12 | FLAT CABLE FDM-010                |                                                                               | 17       | 3-057-164-11 | INSULATOR                        | (ED215/ED515/ED616/ED815/ED817/ED818/ED915/ED919/EZ715/EZ717)         |
| *          | A-6713-877-A | DI-081 COplete PWB                |                                                                               | 18       | 3-057-165-01 | PLATE, EARTH                     |                                                                       |
| 7          | 1-757-553-11 | FLAT CABLE FDI-002                |                                                                               |          |              |                                  |                                                                       |
| *          | A-6713-870-A | FJ-031 COMPLETE PWB               | (ED115/ED215/ED313/ED815/ED817/EZ111/EZ212/EZ414)                             |          |              |                                  |                                                                       |
| *          | A-6713-878-A | FJ-031 COMPLETE PWB               | (ED515/ED616/EZ715/EZ717)                                                     |          |              |                                  |                                                                       |
| *          | A-6713-889-A | FJ-031 COMPLETE PWB               | (ED818/ED915/ED919)                                                           |          |              |                                  |                                                                       |
| $\Delta$ 9 | 1-757-665-11 | CORD, POWER                       | (ED115/ED215/ED313/ED515/ED616/ED815/ED817/ED818/ED915/ED919)                 |          |              |                                  |                                                                       |
| $\Delta$ 9 | 1-777-855-51 | CORD, POWER                       | (EZ111/EZ212/EZ414/EZ715/EZ717)                                               |          |              |                                  |                                                                       |
| 10         | 3-064-641-41 | CASE, UPPER                       | (ED215/ED515/ED616: ME, SG/ED815/ED817/ED818: ME, SG/ED915/ED919/EZ715/EZ717) |          |              |                                  |                                                                       |
| 10         | 3-064-641-71 | CASE, UPPER (ED115/ED313: ME, SG) |                                                                               |          |              |                                  |                                                                       |

8-1-2. CHASSIS SECTION



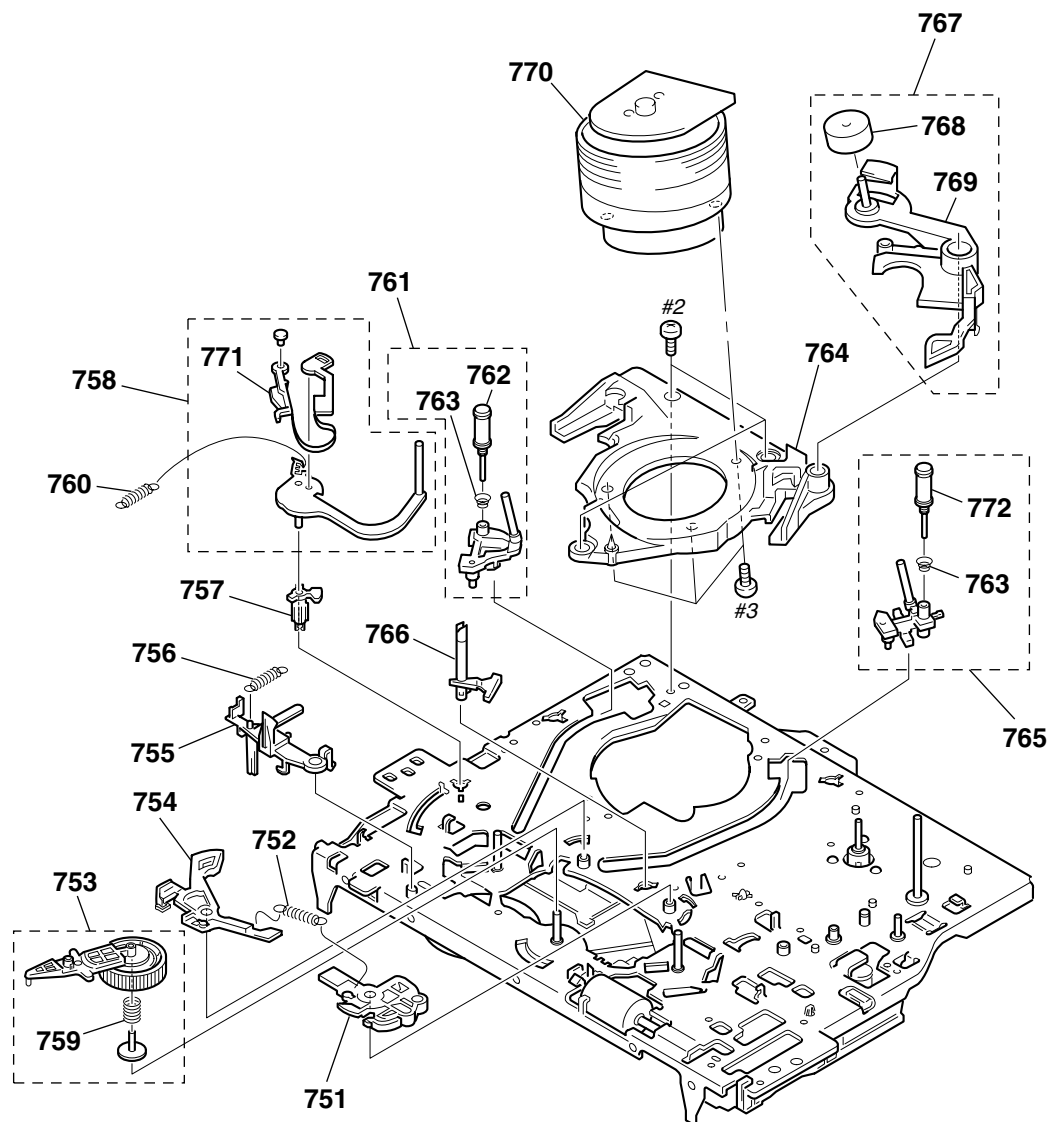
| Ref. No. | Part No.     | Description                                                                                              | Remarks |
|----------|--------------|----------------------------------------------------------------------------------------------------------|---------|
| 51       | 3-959-383-01 | BASE (R), MD                                                                                             |         |
| * 52     | A-6713-865-A | MA-402 COMPLETE PWB (ED818)                                                                              |         |
| * 52     | A-6713-866-A | MA-402 COMPLETE PWB (ED919)                                                                              |         |
| * 52     | A-6713-868-A | MA-402 COMPLETE PWB (EZ715AS)                                                                            |         |
| * 52     | A-6713-869-A | MA-402 COMPLETE PWB (ED815)                                                                              |         |
| * 52     | A-6713-873-A | MA-402 COMPLETE PWB (ED817)                                                                              |         |
| * 52     | A-6713-874-A | MA-402 COMPLETE PWB (ED915)                                                                              |         |
| * 52     | A-6713-885-A | MA-402 COMPLETE PWB (ED115/ED215)                                                                        |         |
| * 52     | A-6713-886-A | MA-402 COMPLETE PWB (ED313: ME, SG)                                                                      |         |
| * 52     | A-6713-888-A | MA-402 COMPLETE PWB (ED515)                                                                              |         |
| * 52     | A-6713-890-A | MA-402 COMPLETE PWB (ED616: ME, SG)                                                                      |         |
| * 52     | A-6713-891-A | MA-402 COMPLETE PWB (EZ111)                                                                              |         |
| * 52     | A-6713-892-A | MA-402 COMPLETE PWB (EZ414)                                                                              |         |
| * 52     | A-6713-893-A | MA-402 COMPLETE PWB (EZ212)                                                                              |         |
| * 52     | A-6794-816-A | MA-402 COMPLETE PWB (ED313 MJ)                                                                           |         |
| * 52     | A-6794-817-A | MA-402 COMPLETE PWB (ED616 MJ)                                                                           |         |
| 53       | 3-970-605-21 | SUMITITE (B3), +BV                                                                                       |         |
| 54       | 1-757-690-11 | CABLE, FLAT (FMD-022)<br>(ED515/ED616/ED815/ED817/ED818/ED915/<br>ED919/EZ414/EZ715/EZ717)               |         |
| 54       | 1-757-691-11 | CABLE, FLAT (FMD-023)<br>(ED115/ED215/ED313/EZ111/EZ212)                                                 |         |
| * 55     | A-6713-875-A | NK-11 BOARD, COMPLETE<br>(ED915/ED919/ED715NZ/EZ717NZ)                                                   |         |
| * 55     | A-6713-872-Z | GK-12 BOARD, COMPLETE<br>(EZ715AS/EZ717AS)                                                               |         |
| 56       | 1-757-551-11 | CABLE, FLAT (FAC-009)                                                                                    |         |
| 57       | X-3951-402-1 | PANEL ASSY, REAR<br>(ED919/ED915/ED815/ED817/ED818/EZ715/<br>EZ717)                                      |         |
| 57       | X-3951-403-1 | PANEL ASSY, REAR<br>(ED515/ED616: ME, SG/EZ414)                                                          |         |
| 57       | X-3951-404-1 | PANEL ASSY, REAR<br>(ED115/ED215/ED313: ME, SG/EZ111/EZ212)                                              |         |
| 57       | X-3951-405-1 | PANEL ASSY, REAR (ED616 MJ)                                                                              |         |
| 57       | X-3951-406-1 | PANEL ASSY, REAR (ED313 MJ)                                                                              |         |
| 58       | 3-064-638-01 | PANEL, REAR<br>(ED919/ED915/ED815/ED817/ED818/EZ715/<br>EZ717)                                           |         |
| 58       | 3-064-638-11 | PANEL, REAR<br>(ED515/ED616/EZ414)                                                                       |         |
| 58       | 3-064-638-21 | PANEL, REAR<br>(ED115/ED215/ED313/EZ111/EZ212)                                                           |         |
| 59       | X-3950-969-1 | TC(N17S) ASSY (SL)<br>(ED115/ED215/ED313/ED515/ED616/ED815/<br>ED817/ED818/ED915/ED919/EZ717AS)          |         |
| 60       | 3-063-782-01 | TC(N17S) HOLDER (SL)<br>(ED115/ED215/ED313/ED515/ED616/ED815/<br>ED817/ED818/ED915/ED919/EZ717AS)        |         |
| 61       | 3-342-512-21 | SCREW (B1.7 X 3.5), TAPPING<br>(ED115/ED215/ED313/ED515/ED616/ED815/<br>ED817/ED818/ED915/ED919/EZ717AS) |         |
| #1       | 7-685-648-79 | SCREW + BVTP 3 X 12 TYPE 2 IT-3                                                                          |         |

### 8-1-3. MECHANISM DECK SECTION-1



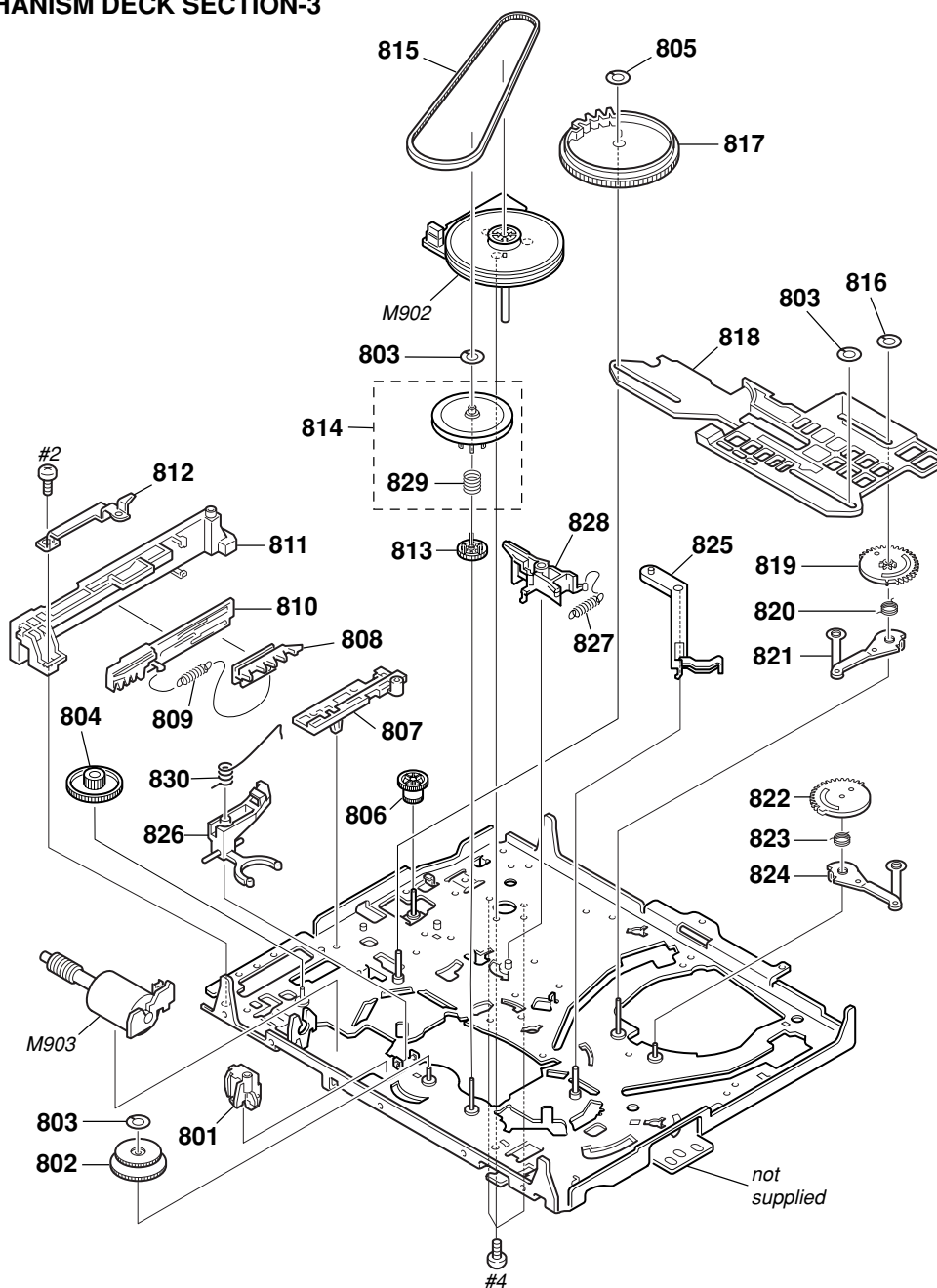
| Ref. No. | Part No.     | Description                  | Remarks | Ref. No. | Part No.     | Description                    | Remarks |
|----------|--------------|------------------------------|---------|----------|--------------|--------------------------------|---------|
| 701      | 3-977-509-01 | WASHER, THRUST               |         | 714      | 3-063-773-02 | OPENER, LID (SL)               |         |
| 702      | 3-977-507-01 | TABLE, REEL (S)              |         | 715      | 3-977-441-03 | GEAR, PINCH PRESSING           |         |
| 703      | 3-977-508-01 | TABLE, REEL (T)              |         | 716      | 3-977-445-02 | GEAR, TG8 ARM DRIVING          |         |
| 704      | 1-500-471-11 | HEAD, FE                     |         | 717      | 3-062-763-01 | SPRING, EXTENSION (RVS BRAKE)  |         |
| 705      | 3-977-495-01 | SHAFT, TG2                   |         | 718      | X-3950-964-1 | ARM ASSY, RVS BRAKE (SL)       |         |
| 706      | 3-977-494-01 | HOLDER, FEH                  |         | 719      | 3-063-756-01 | GEAR, TG8 ARM H/R              |         |
| 707      | A-6776-359-C | FL, COMPLETE ASSY (SL)       |         | 720      | X-3947-590-1 | TG8 ASSY                       |         |
| 708      | 3-977-535-01 | PLATE, LUMINOUS (END SENSOR) |         | 721      | A-6759-620-A | HEAD BLOCK ASSY, ACE (TDK) FFC |         |
| 709      | 3-977-536-01 | PLATE, LUMINOUS (TOP SENSOR) |         | 722      | 3-974-556-11 | + HEXA TT 2.6 x 9 (TAPER)      |         |
| 710      | 3-977-443-01 | WASHER, STOPPER              |         | 723      | 3-979-508-01 | SCREW + HEXA TP SW 3 x 8       |         |
| 711      | A-6759-863-B | PRESS BLOCK ASSY, PINCH      |         | 724      | 3-059-958-01 | SPRING, TG8                    |         |
| 712      | 3-958-455-01 | SPRING (PINCH), TENSION      |         | 725      | 3-051-300-03 | LOCK ACE SCREW                 |         |
| 713      | 3-977-447-01 | GEAR, ELEVATOR               |         | #2       | 7-685-646-79 | SCREW + BVTP 3 x 8 TYPE2       |         |

## 8-1-4. MECHANISM DECK SECTION-2



| Ref. No. | Part No.     | Description                       | Remarks | Ref. No. | Part No.     | Description                                                         | Remarks |
|----------|--------------|-----------------------------------|---------|----------|--------------|---------------------------------------------------------------------|---------|
| 751      | X-3949-363-1 | BRAKE ASSY, MAIN (T)              |         | 766      | 3-977-501-01 | PLATE, LUMINOUS                                                     |         |
| 752      | 3-053-882-01 | SPRING, TENS (MAIN BRAKE)         |         | 767      | A-6746-074-G | ROLLER BLOCK ASSY, HC                                               |         |
| 753      | X-3947-573-1 | ARM ASSY, PENDULUM                |         | 768      | X-3947-255-1 | ROLLER ASSY, HC                                                     |         |
| 754      | X-3951-005-1 | BRAKE ASSY, MAIN (S)              |         | 769      | 3-975-724-07 | ARM, HC                                                             |         |
| 755      | 3-063-772-01 | LEVER, REC PROOF (SL)             |         | 770      | 1-772-360-11 | DRUM ASSY DZH-89D-R<br>(ED115/ED215/ED313/EZ111/EZ212)              |         |
| 756      | 3-976-767-01 | SPRING, TENS. (REC PROOF)         |         | 770      | 1-796-012-11 | DRUM ASSY DZH-0D1A-R<br>(ED815/ED817/ED818/ED915/ED919/EZ715/EZ717) |         |
| 757      | 3-977-487-01 | BOSS, TG1 FULCRUM                 |         | 770      | 1-796-011-11 | DRUM ASSY DZH-0D0A-R<br>(ED515/ED616/EZ414)                         |         |
| 758      | X-3950-966-1 | TG1 ASSY (SL)                     |         | 771      | X-3950-968-1 | BAND, ASSY TG1 (SL)                                                 |         |
| 759      | 3-063-958-01 | SPRING, COMP (SL PEND)            |         | 772      | X-3948-050-1 | ROLLER ASSY GUIDE                                                   |         |
| 760      | 3-977-488-01 | SPRING, EXTENSION (POWER TENSION) |         | #2       | 7-685-646-79 | SCREW + BVTP 3 x 8 TYPE 2                                           |         |
| 761      | A-6775-922-A | SHUTTLE (S) BLOCK ASSY            |         | #3       | 7-682-647-09 | SCREW + P3 x 6                                                      |         |
| 762      | X-3949-910-2 | G. ROLLER ASSY                    |         |          |              |                                                                     |         |
| 763      | 3-965-178-01 | SPRING                            |         |          |              |                                                                     |         |
| 764      | 3-062-687-01 | BASE DRUM, K (UPPER MOTOR)        |         |          |              |                                                                     |         |
| 765      | A-6750-328-E | SHUTTLE (T) BLOCK ASSY            |         |          |              |                                                                     |         |

### 8-1-5. MECHANISM DECK SECTION-3



| Ref. No. | Part No.     | Description                  | Remarks | Ref. No. | Part No.     | Description                     | Remarks |
|----------|--------------|------------------------------|---------|----------|--------------|---------------------------------|---------|
| 801      | 3-977-437-01 | RETAINER, CAM MOTOR          |         | 818      | 3-063-768-01 | SLIDER (SL)                     |         |
| 802      | X-3949-364-1 | ASSY, REEL DIRECT SELECT (B) |         | 819      | 3-063-757-01 | GEAR, LOADING (T) H/R           |         |
| 803      | 3-977-443-01 | WASHER, STOPPER              |         | 820      | 3-977-456-03 | SPRING, TORSION (LOAD T)        |         |
| 804      | 3-063-785-01 | WORM - WHEEL (SL)            |         | 821      | X-3948-132-2 | LEVER ASSY, LOADING (T)         |         |
| 805      | 3-056-952-11 | WASHER, STOPPER              |         | 822      | 3-063-783-01 | GEAR, LOADING (S) H/R           |         |
| 806      | 3-977-444-01 | GEAR, PINCH TRANSMISSION     |         | 823      | 3-977-452-01 | SPRING, TORSION (LOAD S)        |         |
| 807      | 3-977-515-01 | GUIDE, FL SLIDER             |         | 824      | X-3948-131-1 | LEVER ASSY LOADING (S)          |         |
| 808      | 3-977-517-01 | PLATE, SLIDE, FL             |         | 825      | 3-977-489-01 | ARM, TG1 DRIVING                |         |
| 809      | 3-977-519-01 | SPRING, TENS. (LIMIT, FL)    |         | 826      | 3-063-777-01 | BASE DIRECT SELECT (SL)         |         |
| 810      | 3-977-518-02 | PLATE, LIMITTER, FL          |         | 827      | 3-977-467-02 | SPRING, CAP BRAKE               |         |
| 811      | 3-977-516-01 | HOLDER, FL SLIDER            |         | 828      | X-3950-965-1 | BRAKE ASSY, CAPSTAN (SL)        |         |
| 812      | 3-977-877-01 | PLATE, RETAINER              |         | 829      | 3-063-823-01 | SPRING, COMP (LIMITTER LOW K)   |         |
| 813      | 3-977-504-01 | GEAR, CLUTCH                 |         | 830      | 3-063-778-02 | SPRING TOR. (BASE, D. S SL)     |         |
| 814      | X-3947-365-1 | GEAR, ASSY, PULLEY (B)       |         | M902     | 1-763-572-11 | MOTOR, DC                       |         |
| 815      | 3-977-510-01 | BELT RUBBER                  |         | M903     | X-3950-970-1 | MOTOR ASSY, CAM (SL)            |         |
| 816      | 3-056-824-01 | WASHER, STOPPER              |         | #2       | 7-685-646-79 | SCREW + BVTP 3 x 8 TYPE 2 IT-3  |         |
| 817      | 3-063-439-01 | GEAR, CAM                    |         | #4       | 7-685-133-19 | SCREW + P2.6 x 6 TYPE2 NON-SLIT |         |

DI-81

DM-98

FJ-31

## 8-2. ELECTRICAL PARTS LIST

### NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:  
uF:  $\mu$ F
- RESISTORS  
All resistors are in ohms.  
METAL: metal-film resistor  
METAL OXIDE: Metal Oxide-film resistor  
F: nonflammable
- COILS  
uH:  $\mu$ H
- SEMICONDUCTORS  
In each case, u:  $\mu$ , for example:  
uA...:  $\mu$ A..., uPA...,  $\mu$ PA...,  
uPB...,  $\mu$ PB..., uPC...,  $\mu$ PC...,  
uPD...,  $\mu$ PD...

When indicating parts by reference number, please include the board name.

The components identified by mark  $\triangle$  or dotted line with mark  $\triangle$  are critical for safety. Replace only with part number specified.

| Ref. No. | Part No.     | Description                    | Remarks | Ref. No. | Part No.     | Description                                                        | Remarks |
|----------|--------------|--------------------------------|---------|----------|--------------|--------------------------------------------------------------------|---------|
|          | A-6713-877-A | DI-081 BOARD COMPLETE<br>***** |         |          |              | <SWITCH>                                                           |         |
|          |              | <CONNECTOR>                    |         | S462     | 1-762-196-21 | SWITCH, TACT ( $\triangle$ EJECT)                                  |         |
|          |              |                                |         | S463     | 1-762-196-21 | SWITCH, TACT ( $\bullet$ REC)                                      |         |
|          |              |                                |         | S466     | 1-762-196-21 | SWITCH, TACT ( $\blacktriangleleft$ REW)                           |         |
| CN901    | 1-695-368-31 | CONNECTOR, FFC/FPC 7P          |         | S467     | 1-762-196-21 | SWITCH, TACT ( $\blacksquare$ STOP)                                |         |
| CN901    | 1-784-449-11 | CONNECTOR, FFC/FPC 7P          |         | S468     | 1-762-196-21 | SWITCH, TACT ( $\blacktriangleright$ PLAY)                         |         |
|          |              | <DIODE>                        |         | S469     | 1-762-196-21 | SWITCH, TACT ( $\blacktriangleright\blacktriangleright$ FF)        |         |
| D900     | 8-719-056-06 | DIODE SLR-342DCT31             |         | S472     | 1-762-196-21 | SWITCH, TACT ( $\blacksquare\blacksquare$ PAUSE)                   |         |
|          |              | <RESISTOR>                     |         |          |              |                                                                    |         |
| R900     | 1-216-295-00 | SHORT 0                        |         |          | A-6713-870-A | FJ-031 BOARD COMPLETE<br>(ED115/ED215/ED313/EZ111/EZ212/EZ414)     |         |
| R902     | 1-216-043-91 | RES-CHIP 560 5% 1/10W          |         |          | A-6713-878-A | FJ-031 BOARD COMPLETE<br>(ED818/ED915/ED919/EZ715/EZ717)           |         |
|          |              | <SWITCH>                       |         |          | A-6713-889-A | FJ-031 BOARD COMPLETE<br>(ED515/ED616)                             |         |
| S900     | 1-762-196-21 | SWITCH, TACT                   |         |          |              | *****                                                              |         |
| S901     | 1-418-059-22 | ENCODER, ROTARY                |         |          |              | <CONNECTOR>                                                        |         |
|          |              |                                |         | CN532    | 1-695-368-31 | CONNECTOR, FFC/FPC 7P                                              |         |
|          |              |                                |         | CN532    | 1-784-449-11 | CONNECTOR, FFC/FPC 7P                                              |         |
|          |              |                                |         |          |              | <JACK>                                                             |         |
|          |              |                                |         | CNJ531   | 1-770-021-11 | JACK, PIN 3P (ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717)       |         |
|          |              |                                |         |          |              | <DIODE>                                                            |         |
|          |              |                                |         | D531     | 8-719-071-15 | DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          |              |                                |         | D532     | 8-719-071-15 | DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          |              |                                |         | D533     | 8-719-071-15 | DIODE HZM6.8ZWA1TL (ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          |              |                                |         | D534     | 8-719-017-09 | DIODE 02DZ6.2-TPH3 (ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          |              |                                |         |          |              | <JUMPER SELECTOR>                                                  |         |
|          |              |                                |         | JS531    | 1-216-296-00 | SHORT 0 (ED515/ED616/<br>ED818/ED915/ED919/EZ715/EZ717)            |         |
|          |              |                                |         | JS532    | 1-216-296-00 | SHORT 0 (ED515/ED616/<br>ED818/ED915/ED919/EZ715/EZ717)            |         |
|          |              |                                |         | JS534    | 1-216-295-00 | SHORT 0                                                            |         |
|          | A-6713-876-A | DM-098 BOARD COMPLETE<br>***** |         |          |              |                                                                    |         |
|          |              | <CONNECTOR>                    |         |          |              |                                                                    |         |
| CN471    | 1-770-514-31 | CONNECTOR, FFC/FPC 5P          |         |          |              |                                                                    |         |
| CN471    | 1-784-447-11 | CONNECTOR, FFC/FPC 5P          |         |          |              |                                                                    |         |
|          |              | <CHIP CONDUCTOR>               |         |          |              |                                                                    |         |
| JR461    | 1-216-295-00 | SHORT 0                        |         |          |              |                                                                    |         |
|          |              | <RESISTOR>                     |         |          |              |                                                                    |         |
| R465     | 1-216-053-00 | RES-CHIP 1.5K 5% 1/10W         |         |          |              |                                                                    |         |
| R467     | 1-216-057-00 | RES-CHIP 2.2K 5% 1/10W         |         |          |              |                                                                    |         |
| R468     | 1-216-053-00 | RES-CHIP 1.5K 5% 1/10W         |         |          |              |                                                                    |         |
| R469     | 1-216-053-00 | RES-CHIP 1.5K 5% 1/10W         |         |          |              |                                                                    |         |
| R470     | 1-216-057-00 | RES-CHIP 2.2K 5% 1/10W         |         |          |              |                                                                    |         |
| R474     | 1-216-295-00 | SHORT 0                        |         |          |              |                                                                    |         |
| R475     | 1-216-295-00 | SHORT 0                        |         |          |              |                                                                    |         |

| Ref. No. | Part No.     | Description                                                               | Remarks |
|----------|--------------|---------------------------------------------------------------------------|---------|
|          |              | <RESISTOR>                                                                |         |
| R533     | 1-216-021-00 | RES-CHIP 68 5% 1/10W<br>(ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717)   |         |
| R534     | 1-216-097-11 | RES-CHIP 100K 5% 1/10W<br>(ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
| R535     | 1-216-097-11 | RES-CHIP 100K 5% 1/10W<br>(ED515/ED616/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          |              | <SWITCH>                                                                  |         |
| S500     | 1-762-196-21 | SWITCH, TACT                                                              |         |

A-6713-872-A GK-12 BOARD COMPLETE  
(EZ715AS/EZ717AS)

\*\*\*\*\*

<CAPACITOR>

|      |              |              |          |        |     |
|------|--------------|--------------|----------|--------|-----|
| C003 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C006 | 1-163-137-00 | CERAMIC CHIP | 680PF    | 5%     | 50V |
| C007 | 1-164-699-11 | CERAMIC CHIP | 0.0033uF | 5.00%  | 50V |
| C008 | 1-164-699-11 | CERAMIC CHIP | 0.0033uF | 5.00%  | 50V |
| C009 | 1-163-137-00 | CERAMIC CHIP | 680PF    | 5%     | 50V |
| C010 | 1-163-243-11 | CERAMIC CHIP | 47PF     | 5.00%  | 50V |
| C011 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C012 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C013 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C014 | 1-164-004-11 | CERAMIC CHIP | 0.1uF    | 10%    | 25V |
| C015 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C016 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C017 | 1-163-017-00 | CERAMIC CHIP | 0.0047uF | 5%     | 50V |
| C018 | 1-107-823-11 | CERAMIC CHIP | 0.47uF   | 10.00% | 16V |
| C022 | 1-163-021-91 | CERAMIC CHIP | 0.01uF   | 10.00% | 50V |
| C023 | 1-163-021-91 | CERAMIC CHIP | 0.01uF   | 10.00% | 50V |

< CONNECTOR >

\* CN001 1-691-183-11 CONNECTOR (BOARD TO BOARD) 13P

< IC >

IC001 8-759-579-30 IC TDA9873H/V1, 518

< JUMPER RESISTOR >

|       |              |            |   |    |       |
|-------|--------------|------------|---|----|-------|
| JS002 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |
| JS003 | 1-216-295-00 | METAL CHIP | 0 | 5% | 1/10W |

< RESISTOR >

|      |              |            |      |    |       |
|------|--------------|------------|------|----|-------|
| R001 | 1-216-295-00 | METAL CHIP | 0    | 5% | 1/10W |
| R002 | 1-216-295-00 | METAL CHIP | 0    | 5% | 1/10W |
| R004 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| R005 | 1-216-067-00 | METAL CHIP | 5.6K | 5% | 1/10W |
| R006 | 1-216-057-00 | METAL CHIP | 2.2K | 5% | 1/10W |

| Ref. No. | Part No.     | Description              | Remarks    |
|----------|--------------|--------------------------|------------|
| R007     | 1-216-045-00 | METAL CHIP 680           | 5% 1/10W   |
| R008     | 1-216-041-00 | METAL CHIP 470           | 5% 1/10W   |
| R009     | 1-216-041-00 | METAL CHIP 470           | 5% 1/10W   |
| R010     | 1-208-803-11 | METAL CHIP 7.5K          | 0.5% 1/10W |
| R011     | 1-216-295-00 | METAL CHIP 0             | 5% 1/10W   |
| R012     | 1-216-298-00 | METAL CHIP 2.2           | 5% 1/10W   |
|          |              | < VARIABLE RESISTOR >    |            |
| RV001    | 1-241-783-11 | RES, ADJ, CARBON 2.2K    |            |
|          |              | < VIBRATOR >             |            |
| X001     | 1-781-353-11 | VIBRATOR, CRYSTAL (4MHz) |            |

A-6713-865-A MA-402 BOARD COMPLETE (ED818)  
A-6713-866-A MA-402 BOARD COMPLETE (ED919)  
A-6713-867-A MA-402 BOARD COMPLETE (EZ717NZ)  
A-6713-868-A MA-402 BOARD COMPLETE (EZ715AS)  
A-6713-869-A MA-402 BOARD COMPLETE (ED815)

A-6713-871-A MA-402 BOARD COMPLETE (EZ717AS)  
A-6713-873-A MA-402 BOARD COMPLETE (ED817)  
A-6713-874-A MA-402 BOARD COMPLETE (ED915)  
A-6713-879-A MA-402 BOARD COMPLETE (EZ715NZ)  
A-6713-885-A MA-402 BOARD COMPLETE (ED115/ED215)

A-6713-886-A MA-402 BOARD COMPLETE (ED313: ME, SG)  
A-6713-888-A MA-402 BOARD COMPLETE (ED515)  
A-6713-890-A MA-402 BOARD COMPLETE (ED616: ME, SG)  
A-6713-891-A MA-402 BOARD COMPLETE (EZ111)  
A-6713-892-A MA-402 BOARD COMPLETE (EZ414)

A-6713-893-A MA-402 BOARD COMPLETE (EZ212)  
A-6794-816-A MA-402 BOARD COMPLETE (ED313)  
A-6794-817-A MA-402 BOARD COMPLETE (ED616)

\*\*\*\*\*

3-064-645-01 HOLDER, FL  
3-065-718-01 SINK, HEAT  
3-960-273-11 SPACER, TOP END  
3-960-274-01 SPACER, LED

<CAPACITOR>

|      |              |              |         |        |                     |
|------|--------------|--------------|---------|--------|---------------------|
| C001 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10.00% | 50V                 |
| C002 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10.00% | 50V                 |
| C003 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10.00% | 50V                 |
| C004 | 1-163-009-11 | CERAMIC CHIP | 0.001uF | 10.00% | 50V                 |
| C005 | 1-128-057-11 | ELECT        | 330uF   | 20.00% | 6.3V                |
| C006 | 1-107-823-11 | CERAMIC CHIP | 0.47uF  | 10.00% | 16V                 |
| C007 | 1-107-823-11 | CERAMIC CHIP | 0.47uF  | 10.00% | 16V                 |
|      |              |              |         |        | (EZ111/EZ212/ED313) |
| C008 | 1-107-823-11 | CERAMIC CHIP | 0.47uF  | 10.00% | 16V                 |
| C009 | 1-107-823-11 | CERAMIC CHIP | 0.47uF  | 10.00% | 16V                 |
| C010 | 1-107-823-11 | CERAMIC CHIP | 0.47uF  | 10.00% | 16V                 |
| C011 | 1-164-232-11 | CERAMIC CHIP | 0.01uF  | 10.00% | 50V                 |
| C012 | 1-164-232-11 | CERAMIC CHIP | 0.01uF  | 10.00% | 50V                 |
| C013 | 1-163-243-11 | CERAMIC CHIP | 47PF    | 5.00%  | 50V                 |
| C014 | 1-164-232-11 | CERAMIC CHIP | 0.01uF  | 10.00% | 50V                 |
| C015 | 1-163-231-11 | CERAMIC CHIP | 15PF    | 5.00%  | 50V                 |

# MA-402

| Ref. No. | Part No.     | Description           | Remarks                            |
|----------|--------------|-----------------------|------------------------------------|
| C016     | 1-163-233-11 | CERAMIC CHIP 18PF     | 5.00% 50V                          |
| C017     | 1-110-501-11 | CERAMIC CHIP 0.33uF   | 10.00% 16V                         |
| C018     | 1-163-989-11 | CERAMIC CHIP 0.033uF  | 10.00% 25V                         |
| C019     | 1-109-982-11 | CERAMIC CHIP 1uF      | 10.00% 10V                         |
| C020     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                         |
| C021     | 1-113-642-11 | TANTAL. CHIP 47uF     | 10.00% 10V                         |
| C022     | 1-107-823-11 | CERAMIC CHIP 0.47uF   | 10.00% 16V                         |
| C023     | 1-163-243-11 | CERAMIC CHIP 47PF     | 5.00% 50V                          |
| C031     | 1-128-499-11 | ELECT 220uF           | 20.00% 16V                         |
| C032     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C034     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C051     | 1-124-589-11 | ELECT 47uF            | 20.00% 16V                         |
| C053     | 1-164-344-11 | CERAMIC CHIP 0.068uF  | 10.00% 25V                         |
| C054     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                |
| C071     | 1-163-809-11 | CERAMIC CHIP 0.047uF  | 10.00% 25V                         |
| C072     | 1-164-489-11 | CERAMIC CHIP 0.22uF   | 10.00% 16V                         |
| C073     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C074     | 1-163-009-11 | CERAMIC CHIP 0.001uF  | 10.00% 50V                         |
| C075     | 1-163-259-91 | CERAMIC CHIP 220PF    | 5.00% 50V                          |
| C076     | 1-126-941-11 | ELECT 470uF           | 20.00% 25V                         |
| C078     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V<br>(EZ111/EZ212/ED313)         |
| C100     | 1-163-235-11 | CERAMIC CHIP 22PF     | 5.00% 50V                          |
| C101     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                |
| C102     | 1-127-890-11 | DOUBLE LAYER 0.47F    | 5.5V<br>(ED313/ED616/ED818)        |
| C103     | 1-104-905-11 | CAPACITOR 0.22F       | 5.5V<br>(EXCEPT ED313/ED616/ED818) |
| C104     | 1-126-935-11 | ELECT 470uF           | 20.00% 10V                         |
| C105     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                         |
| C106     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C107     | 1-164-182-11 | CERAMIC CHIP 0.0033uF | 10.00% 50V                         |
| C108     | 1-163-231-11 | CERAMIC CHIP 15PF     | 5.00% 50V                          |
| C109     | 1-163-231-11 | CERAMIC CHIP 15PF     | 5.00% 50V                          |
| C110     | 1-163-234-11 | CERAMIC CHIP 20PF     | 5.00% 50V                          |
| C111     | 1-163-234-11 | CERAMIC CHIP 20PF     | 5.00% 50V                          |
| C112     | 1-164-489-11 | CERAMIC CHIP 0.22uF   | 10.00% 16V                         |
| C113     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                         |
| C114     | 1-104-664-11 | ELECT 47uF            | 20.00% 25V                         |
| C141     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C142     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C143     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                         |
| C151     | 1-164-505-11 | CERAMIC CHIP 2.2uF    | 16V                                |
| C152     | 1-126-163-11 | ELECT 4.7uF           | 20.00% 50V                         |
| C154     | 1-126-163-11 | ELECT 4.7uF           | 20.00% 50V                         |
| C155     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C159     | 1-163-251-11 | CERAMIC CHIP 100PF    | 5.00% 50V<br>(ED919)               |
| C160     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C161     | 1-163-096-00 | CERAMIC CHIP 13PF     | 5.00% 50V                          |
| C162     | 1-163-096-00 | CERAMIC CHIP 13PF     | 5.00% 50V                          |
| C163     | 1-163-229-11 | CERAMIC CHIP 12PF     | 5.00% 50V                          |
| C164     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                         |
| C165     | 1-163-227-11 | CERAMIC CHIP 10PF     | 0.50PF 50V                         |
| C166     | 1-163-229-11 | CERAMIC CHIP 12PF     | 5.00% 50V<br>(ED919)               |
| C167     | 1-164-489-11 | CERAMIC CHIP 0.22uF   | 10.00% 16V                         |
| C168     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                         |
| C169     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                |
| C171     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                |

| Ref. No. | Part No.     | Description           | Remarks                                              |
|----------|--------------|-----------------------|------------------------------------------------------|
| C172     | 1-163-245-11 | CERAMIC CHIP 56PF     | 5.00% 50V                                            |
| C191     | 1-163-137-00 | CERAMIC CHIP 680PF    | 5.00% 50V<br>(ED616/ED818/EZ717)                     |
| C192     | 1-163-145-00 | CERAMIC CHIP 0.0015uF | 5.00% 50V                                            |
| C193     | 1-164-004-11 | CERAMIC CHIP 0.1uF    | 10.00% 25V                                           |
| C194     | 1-124-589-11 | ELECT 47uF            | 20.00% 16V                                           |
| C195     | 1-124-234-00 | ELECT 22uF            | 20.00% 16V                                           |
| C196     | 1-163-145-00 | CERAMIC CHIP 0.0015uF | 5.00% 50V                                            |
| C197     | 1-164-182-11 | CERAMIC CHIP 0.0033uF | 10.00% 50V<br>(ED616/ED818/EZ717)                    |
| C201     | 1-164-505-11 | CERAMIC CHIP 2.2uF    | 16V                                                  |
| C202     | 1-163-017-00 | CERAMIC CHIP 0.0047uF | 10.00% 50V<br>(EXCEPT ED115/ED215/ED313)             |
| C202     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313)                    |
| C203     | 1-164-161-11 | CERAMIC CHIP 0.0022uF | 10.00% 50V<br>(EXCEPT ED115/ED215/ED313)             |
| C203     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313)                    |
| C204     | 1-164-161-11 | CERAMIC CHIP 0.0022uF | 10.00% 50V<br>(EXCEPT ED115/ED215/ED313)             |
| C204     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313)                    |
| C205     | 1-163-017-00 | CERAMIC CHIP 0.0047uF | 10.00% 50V<br>(EXCEPT ED115/ED215/ED313)             |
| C205     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313)                    |
| C206     | 1-163-989-11 | CERAMIC CHIP 0.033uF  | 10.00% 25V                                           |
| C207     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                                           |
| C208     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                                  |
| C209     | 1-126-162-11 | ELECT 3.3uF           | 20.00% 50V                                           |
| C210     | 1-163-243-11 | CERAMIC CHIP 47PF     | 5.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)         |
| C211     | 1-163-243-11 | CERAMIC CHIP 47PF     | 5.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)         |
| C212     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)        |
| C213     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)        |
| C214     | 1-163-235-11 | CERAMIC CHIP 22PF     | 5.00% 50V                                            |
| C215     | 1-164-232-11 | CERAMIC CHIP 0.01uF   | 10.00% 50V                                           |
| C216     | 1-109-982-11 | CERAMIC CHIP 1uF      | 10.00% 10V                                           |
| C217     | 1-163-017-00 | CERAMIC CHIP 0.0047uF | 10.00% 50V                                           |
| C218     | 1-124-257-00 | ELECT 2.2uF           | 20.00% 50V                                           |
| C219     | 1-163-275-11 | CERAMIC CHIP 0.001uF  | 5.00% 50V                                            |
| C220     | 1-107-823-11 | CERAMIC CHIP 0.47uF   | 10.00% 16V                                           |
| C221     | 1-163-037-11 | CERAMIC CHIP 0.022uF  | 10.00% 50V                                           |
| C222     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                                  |
| C223     | 1-126-163-11 | ELECT 4.7uF           | 20.00% 50V                                           |
| C224     | 1-109-982-11 | CERAMIC CHIP 1uF      | 10.00% 10V<br>(EXCEPT ED115/ED215/ED313/ED815/EZ414) |
| C225     | 1-164-505-11 | CERAMIC CHIP 2.2uF    | 16V                                                  |
| C226     | 1-163-089-00 | CERAMIC CHIP 6PF      | 0.50PF 50V                                           |
| C227     | 1-163-255-11 | CERAMIC CHIP 150PF    | 5.00% 50V                                            |
| C228     | 1-163-038-00 | CERAMIC CHIP 0.1uF    | 25V                                                  |
| C229     | 1-126-163-11 | ELECT 4.7uF           | 20.00% 50V                                           |
| C230     | 1-163-235-11 | CERAMIC CHIP 22PF     | 5.00% 50V<br>(ED515/ED815/EZ715)                     |
| C230     | 1-163-233-11 | CERAMIC CHIP 18PF     | 5.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)         |
| C230     | 1-163-227-11 | CERAMIC CHIP 10PF     | 0.50PF 50V<br>(ED616/ED817/ED818//ED915/ED919/EZ717) |
| C231     | 1-163-037-11 | CERAMIC CHIP 0.022uF  | 10.00% 50V                                           |

| Ref. No. | Part No.     | Description                                                                            | Remarks | Ref. No. | Part No.     | Description                                             | Remarks |
|----------|--------------|----------------------------------------------------------------------------------------|---------|----------|--------------|---------------------------------------------------------|---------|
| C232     | 1-163-237-11 | CERAMIC CHIP 27PF 5.00% 50V<br>(ED515/ED815/EZ414/EZ715)                               |         | C307     | 1-124-589-11 | ELECT 47uF 20.00% 16V                                   |         |
| C232     | 1-163-231-11 | CERAMIC CHIP 15PF 5.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                   |         | C308     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C232     | 1-163-227-11 | CERAMIC CHIP 10PF 0.50PF 50V<br>(ED115/ED215/ED313/EZ111/EZ212)                        |         | C309     | 1-163-020-00 | CERAMIC CHIP 0.0082uF 10.00% 50V                        |         |
| C233     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C310     | 1-104-664-11 | ELECT 47uF 20.00% 25V                                   |         |
| C234     | 1-124-589-11 | ELECT 47uF 20.00% 16V                                                                  |         | C311     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C235     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C312     | 1-124-257-00 | ELECT 2.2uF 20.00% 50V                                  |         |
| C236     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C313     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C237     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C314     | 1-104-664-11 | ELECT 47uF 20.00% 25V                                   |         |
| C238     | 1-126-157-11 | ELECT 10uF 20.00% 16V                                                                  |         | C315     | 1-163-020-00 | CERAMIC CHIP 0.0082uF 10.00% 50V                        |         |
| C239     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C316     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C240     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C317     | 1-126-160-11 | ELECT 1uF 20.00% 50V                                    |         |
| C241     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C318     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C242     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                                                 |         | C319     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C243     | 1-126-162-11 | ELECT 3.3uF 20.00% 50V                                                                 |         | C320     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C244     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C322     | 1-126-964-11 | ELECT 10uF 20.00% 50V                                   |         |
| C245     | 1-126-157-11 | ELECT 10uF 20.00% 16V                                                                  |         | C323     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                  |         |
| C246     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C324     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                          |         |
| C247     | 1-164-489-11 | CERAMIC CHIP 0.22uF 10.00% 16V                                                         |         | C326     | 1-164-489-11 | CERAMIC CHIP 0.22uF 10.00% 16V                          |         |
| C248     | 1-124-257-00 | ELECT 2.2uF 20.00% 50V                                                                 |         | C327     | 1-164-489-11 | CERAMIC CHIP 0.22uF 10.00% 16V                          |         |
| C249     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C328     | 1-164-489-11 | CERAMIC CHIP 0.22uF 10.00% 16V                          |         |
| C250     | 1-124-589-11 | ELECT 47uF 20.00% 16V                                                                  |         | C350     | 1-126-157-11 | ELECT 10uF 20.00% 16V                                   |         |
| C251     | 1-164-505-11 | CERAMIC CHIP 2.2uF 16V                                                                 |         | C351     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                  |         |
| C252     | 1-163-263-11 | CERAMIC CHIP 330PF 5.00% 50V                                                           |         | C352     | 1-163-037-11 | CERAMIC CHIP 0.022uF 10.00% 50V                         |         |
| C253     | 1-109-982-11 | CERAMIC CHIP 1uF 10.00% 10V                                                            |         | C354     | 1-124-234-00 | ELECT 22uF 20.00% 16V                                   |         |
| C254     | 1-163-017-00 | CERAMIC CHIP 0.0047uF 10.00% 50V<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)             |         | C355     | 1-126-157-11 | ELECT 10uF 20.00% 16V                                   |         |
| C255     | 1-164-161-11 | CERAMIC CHIP 0.0022uF 10.00% 50V<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)             |         | C356     | 1-163-011-11 | CERAMIC CHIP 0.0015uF 10.00% 50V                        |         |
| C256     | 1-164-161-11 | CERAMIC CHIP 0.0022uF 10.00% 50V<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)             |         | C357     | 1-163-011-11 | CERAMIC CHIP 0.0015uF 10.00% 50V                        |         |
| C257     | 1-163-017-00 | CERAMIC CHIP 0.0047uF 10.00% 50V<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)             |         | C358     | 1-126-163-11 | ELECT 4.7uF 20.00% 50V                                  |         |
| C258     | 1-109-982-11 | CERAMIC CHIP 1uF 10.00% 10V                                                            |         | C359     | 1-126-157-11 | ELECT 10uF 20.00% 16V                                   |         |
| C262     | 1-163-243-11 | CERAMIC CHIP 47PF 5.00% 50V<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)                  |         | C360     | 1-126-160-11 | ELECT 1uF 20.00% 50V<br>(ED515/ED616)                   |         |
| C263     | 1-163-243-11 | CERAMIC CHIP 47PF 5.00% 50V<br>(ED115/ED215/ED313/EZ111/EZ212)                         |         | C361     | 1-126-160-11 | ELECT 1uF 20.00% 50V                                    |         |
| C264     | 1-163-263-11 | CERAMIC CHIP 330PF 5.00% 50V<br>(EXCEPT ED115/ED215/ED313/ED817/EZ111/<br>EZ212/EZ414) |         | C362     | 1-126-160-11 | ELECT 1uF 20.00% 50V                                    |         |
| C289     | 1-164-004-11 | CERAMIC CHIP 0.1uF 10.00% 25V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                 |         | C363     | 1-124-234-00 | ELECT 22uF 20.00% 16V                                   |         |
| C290     | 1-126-163-11 | ELECT 4.7uF 20.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                        |         | C364     | 1-126-163-11 | ELECT 4.7uF 20.00% 50V                                  |         |
| C291     | 1-164-489-11 | CERAMIC CHIP 0.22uF 10.00% 16V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                |         | C365     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                          |         |
| C292     | 1-164-505-11 | CERAMIC CHIP 2.2uF 16V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                        |         | C371     | 1-163-009-11 | CERAMIC CHIP 0.001uF 10.00% 50V                         |         |
| C294     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                |         | C373     | 1-137-505-11 | MYLAR 220PF 5.00% 50V                                   |         |
| C295     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                |         | C375     | 1-104-696-11 | FILM 0.015uF 5.00% 100V<br>(EXCEPT ED616/ED818/EZ717)   |         |
| C296     | 1-126-157-11 | ELECT 10uF 20.00% 16V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                         |         | C375     | 1-137-612-11 | FILM 0.0068uF 5.00% 100V<br>(ED616/ED818/EZ717)         |         |
| C298     | 1-126-163-11 | ELECT 4.7uF 20.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                        |         | C376     | 1-163-011-11 | CERAMIC CHIP 0.0015uF 10.00% 50V                        |         |
| C299     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V<br>(ED616/ED817/ED818/ED915/ED919/EZ717)                |         | C377     | 1-162-306-11 | CERAMIC 0.01uF 20.00% 16V                               |         |
| C303     | 1-164-505-11 | CERAMIC CHIP 2.2uF 16V                                                                 |         | C378     | 1-124-589-11 | ELECT 47uF 20.00% 16V                                   |         |
| C304     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                                                         |         | C379     | 1-163-038-00 | CERAMIC CHIP 0.1uF 25V                                  |         |
|          |              |                                                                                        |         | C380     | 1-104-697-11 | FILM 0.047uF 5.00% 100V<br>(ED616/ED818/EZ717)          |         |
|          |              |                                                                                        |         | C381     | 1-124-589-11 | ELECT 47uF 20.00% 16V<br>(ED616/ED818/EZ717)            |         |
|          |              |                                                                                        |         | C382     | 1-163-011-11 | CERAMIC CHIP 0.0015uF 10.00% 50V<br>(ED616/ED818/EZ717) |         |
|          |              |                                                                                        |         | C383     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V<br>(ED616/ED818/EZ717)   |         |
|          |              |                                                                                        |         | C384     | 1-163-011-11 | CERAMIC CHIP 0.0015uF 10.00% 50V<br>(ED616/ED818/EZ717) |         |
|          |              |                                                                                        |         | C385     | 1-126-160-11 | ELECT 1uF 20.00% 50V<br>(ED818/ED915/ED919/EZ715/EZ717) |         |
|          |              |                                                                                        |         | C386     | 1-126-160-11 | ELECT 1uF 20.00% 50V<br>(ED818/ED915/ED919/EZ715/EZ717) |         |
|          |              |                                                                                        |         | C451     | 1-124-584-00 | ELECT 100uF 20.00% 10V                                  |         |
|          |              |                                                                                        |         | C452     | 1-164-232-11 | CERAMIC CHIP 0.01uF 10.00% 50V                          |         |

# MA-402

| Ref. No. | Part No.     | Description  | Remarks                                        |
|----------|--------------|--------------|------------------------------------------------|
| C453     | 1-126-157-11 | ELECT        | 10uF 20.00% 16V                                |
| C454     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V                                      |
| C455     | 1-124-584-00 | ELECT        | 100uF 20.00% 10V                               |
| C456     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C457     | 1-126-941-11 | ELECT        | 470uF 20.00% 25V                               |
| △ C600   | 1-104-705-11 | MYLAR        | 0.1uF 20.00% 250V                              |
| △ C601   | 1-104-705-11 | MYLAR        | 0.1uF 20.00% 250V                              |
| △ C602   | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                              |
| △ C603   | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                              |
| △ C604   | 1-113-900-11 | CERAMIC      | 470PF 10.00% 250V                              |
| △ C605   | 1-107-405-11 | ELECT(BLOCK) | 68uF 20.00% 400V                               |
| C606     | 1-130-470-00 | MYLAR        | 820PF 5.00% 50V                                |
| C607     | 1-107-737-11 | MYLAR        | 560PF 5.00% 50V                                |
| △ C608   | 1-131-974-11 | FILM         | 2200PF 5% 800V                                 |
| C610     | 1-137-921-11 | ELECT        | 1500uF 20% 10V                                 |
| C611     | 1-126-935-11 | ELECT        | 470uF 20.00% 16V                               |
| C612     | 1-126-960-11 | ELECT        | 1uF 20.00% 50V                                 |
| C613     | 1-130-496-00 | MYLAR        | 0.12uF 5.00% 50V                               |
| C615     | 1-131-976-21 | ELECT        | 820uF 20% 25V                                  |
| C616     | 1-126-941-11 | ELECT        | 470uF 20.00% 25V                               |
| C624     | 1-126-967-11 | ELECT        | 47uF 20.00% 50V                                |
| C626     | 1-126-967-11 | ELECT        | 47uF 20.00% 50V                                |
| C627     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C629     | 1-135-372-31 | ELECT        | 470uF 20% 10V                                  |
| C630     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C631     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C633     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C636     | 1-126-967-11 | ELECT        | 47uF 20.00% 50V                                |
| C661     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C662     | 1-104-666-11 | ELECT        | 220uF 20.00% 25V                               |
| C663     | 1-126-941-11 | ELECT        | 470uF 20.00% 25V                               |
| C664     | 1-124-589-11 | ELECT        | 47uF 20.00% 16V                                |
| C665     | 1-124-234-00 | ELECT        | 22uF 20.00% 16V                                |
| C669     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C671     | 1-126-965-11 | ELECT        | 22uF 20.00% 50V                                |
| C673     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C674     | 1-126-933-11 | ELECT        | 100uF 20.00% 16V                               |
| C701     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C702     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C703     | 1-126-933-11 | ELECT        | 100uF 20.00% 16V                               |
| C704     | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10.00% 50V                             |
| C705     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C706     | 1-126-933-11 | ELECT        | 100uF 20.00% 16V                               |
| C707     | 1-104-664-11 | ELECT        | 47uF 20.00% 25V                                |
| C708     | 1-126-163-11 | ELECT        | 4.7uF 20.00% 50V                               |
| C712     | 1-126-933-11 | ELECT        | 100uF 20.00% 16V                               |
| C713     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C714     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V                              |
| C715     | 1-163-037-11 | CERAMIC CHIP | 0.022uF 10.00% 50V                             |
| C719     | 1-163-038-00 | CERAMIC CHIP | 0.1uF 25V<br>(ED915/ED919/EZ715/EZ717)         |
| C722     | 1-126-933-11 | ELECT        | 100uF 20.00% 16V<br>(ED915/ED919/EZ715/EZ717)  |
| C723     | 1-164-232-11 | CERAMIC CHIP | 0.01uF 10.00% 50V<br>(ED915/ED919/EZ715/EZ717) |
| C730     | 1-163-009-11 | CERAMIC CHIP | 0.001uF 10.00% 50V<br>(ED919/EZ715/EZ717)      |

| Ref. No.    | Part No.     | Description                  | Remarks                                                           |
|-------------|--------------|------------------------------|-------------------------------------------------------------------|
| C731        | 1-163-009-11 | CERAMIC CHIP                 | 0.001uF 10.00% 50V<br>(ED919/EZ715/EZ717)                         |
| C901        | 1-126-160-11 | ELECT                        | 1uF 20.00% 50V<br>(ED815/ED817/<br>ED818/ED915/ED919/ED715/ED717) |
| C902        | 1-126-160-11 | ELECT                        | 1uF 20.00% 50V<br>(ED815/ED817/<br>ED818/ED915/ED919/ED715/ED717) |
| C903        | 1-126-935-11 | ELECT                        | 470uF 20.00% 10V                                                  |
| C907        | 1-124-589-11 | ELECT                        | 47uF 20.00% 16V                                                   |
| <CONNECTOR> |              |                              |                                                                   |
| CN001       | 1-750-152-11 | PIN, CONNECTOR 13P           |                                                                   |
| * CN031     | 1-766-716-11 | CONNECTOR, BOARD TO BOARD 3P |                                                                   |
| CN051       | 1-794-861-11 | CONNECTOR, BOARD TO BOARD 8P |                                                                   |
| CN071       | 1-766-980-71 | CONNECTOR, FFC/FPC 7P        | (ED115/ED215/ED313/EZ111/EZ212)                                   |
| CN072       | 1-784-484-11 | CONNECTOR, FFC/FPC 5P        | (EXCEPT ED115/ED215/ED313/EZ111/EZ212)                            |
| CN201       | 1-784-490-11 | CONNECTOR, FFC/FPC 11P       | (ED818/ED915/ED919/EZ715/EZ717)                                   |
| * CN202     | 1-560-892-00 | PIN, CONNECTOR 4P            |                                                                   |
| CN204       | 1-784-485-11 | CONNECTOR, FFC/FPC 6P        | (EXCEPT ED818/ED915/ED919/EZ715/EZ717)                            |
| CN331       | 1-784-486-11 | CONNECTOR, FFC/FPC 7P        |                                                                   |
| CN332       | 1-506-468-11 | PIN, CONNECTOR 3P            |                                                                   |
| CN334       | 1-766-980-71 | CONNECTOR, FFC/FPC 7P        |                                                                   |
| CN334       | 1-784-486-11 | CONNECTOR, FFC/FPC 7P        |                                                                   |
| CN411       | 1-784-486-11 | CONNECTOR, FFC/FPC 7P        |                                                                   |
| CN412       | 1-766-978-31 | CONNECTOR, FFC/FPC 5P        |                                                                   |
| CN412       | 1-784-484-11 | CONNECTOR, FFC/FPC 5P        |                                                                   |
| △ *CN600    | 1-580-230-11 | PIN, CONNECTOR (PC BOARD) 2P |                                                                   |
| <JACK>      |              |                              |                                                                   |
| CNJ901      | 1-793-001-21 | JACK, PIN (6P)               | (ED815/ED817/<br>ED818/ED915/ED919/EZ715/EZ717)                   |
| CNJ902      | 1-779-012-21 | JACK, PIN 5P                 | (ED515/ED616/EZ414)                                               |
| CNJ903      | 1-779-010-11 | JACK, PIN 4P                 | (ED115/ED215/<br>ED313/ EZ111/EZ212)                              |
| <DIODE>     |              |                              |                                                                   |
| D001        | 8-719-048-26 | DIODE GL528V1                |                                                                   |
| D071        | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                                                   |
| D100        | 8-719-911-19 | DIODE 1SS119-25TD            |                                                                   |
| D101        | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                                                   |
| D102        | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                                                   |
| D103        | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                                                   |
| D151        | 8-719-911-19 | DIODE 1SS119-25TD            |                                                                   |
| D401        | 8-719-059-98 | DIODE SLR-342VCT31           | (EZ715/EZ717)                                                     |
| D402        | 8-719-056-06 | DIODE SLR-342DCT31           | (ED616/ED817/<br>ED818/ED915/ED919/EZ717)                         |
| D403        | 8-719-200-82 | DIODE MPG06D-6052PKG3        |                                                                   |
| D404        | 8-719-109-89 | DIODE RD5.6ES-T1B2           |                                                                   |
| △ D600      | 8-719-051-93 | DIODE DF06M-6031             |                                                                   |
| D601        | 8-719-063-70 | DIODE D1NL20U-TA2            |                                                                   |
| D607        | 8-719-109-89 | DIODE RD5.6ES-T1B2           |                                                                   |
| D608        | 8-719-022-97 | DIODE D2S4MF                 |                                                                   |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

| Ref. No. | Part No.     | Description                                                              | Remarks                                   | Ref. No. | Part No.     | Description | Remarks |
|----------|--------------|--------------------------------------------------------------------------|-------------------------------------------|----------|--------------|-------------|---------|
| D609     | 8-719-083-43 | DIODE 31DQ06-FA7                                                         |                                           | JR004    | 1-216-295-00 | SHORT       | 0       |
| D611     | 8-719-313-17 | DIODE AU02A-V0                                                           |                                           | JR005    | 1-216-295-00 | SHORT       | 0       |
| D612     | 8-719-313-17 | DIODE AU02A-V0                                                           |                                           |          |              |             |         |
| D613     | 8-719-043-76 | DIODE AK04V0                                                             |                                           | JR006    | 1-216-295-00 | SHORT       | 0       |
| D614     | 8-719-160-64 | DIODE RD16F-T8B1                                                         |                                           | JR007    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR008    | 1-216-295-00 | SHORT       | 0       |
| D623     | 8-719-109-93 | DIODE RD6.2ES-T1B2                                                       |                                           | JR009    | 1-216-295-00 | SHORT       | 0       |
| D624     | 8-719-063-70 | DIODE D1NL20U-TA2                                                        |                                           | JR010    | 1-216-295-00 | SHORT       | 0       |
| D625     | 8-719-110-49 | DIODE MTZJ-T-77-18B                                                      |                                           |          |              |             |         |
| D701     | 8-719-150-92 | DIODE RD33ES-T1B3                                                        |                                           | JR011    | 1-216-295-00 | SHORT       | 0       |
| D901     | 8-719-109-93 | DIODE RD6.2ES-T1B2                                                       |                                           | JR012    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR013    | 1-216-295-00 | SHORT       | 0       |
| D902     | 8-719-109-93 | DIODE RD6.2ES-T1B2                                                       |                                           | JR014    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR015    | 1-216-295-00 | SHORT       | 0       |
|          |              | <GROUND TERMINAL>                                                        |                                           | JR016    | 1-216-295-00 | SHORT       | 0       |
| ET600    | 1-537-771-21 | TERMINAL BOARD, GROUND                                                   |                                           | JR017    | 1-216-295-00 | SHORT       | 0       |
| ET601    | 1-537-771-21 | TERMINAL BOARD, GROUND                                                   |                                           | JR018    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR019    | 1-216-295-00 | SHORT       | 0       |
|          |              | <FUSE>                                                                   |                                           | JR020    | 1-216-295-00 | SHORT       | 0       |
| △ F600   | 1-532-203-00 | FUSE                                                                     |                                           | JR021    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR022    | 1-216-295-00 | SHORT       | 0       |
|          |              | <FERRITE BEAD>                                                           |                                           | JR023    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR024    | 1-216-295-00 | SHORT       | 0       |
| FB001    | 1-543-813-21 | FERRITE                                                                  | 0uH                                       | JR025    | 1-216-295-00 | SHORT       | 0       |
| FB002    | 1-543-813-21 | FERRITE                                                                  | 0uH                                       | JR026    | 1-216-295-00 | SHORT       | 0       |
| FB003    | 1-543-813-21 | FERRITE                                                                  | 0uH                                       | JR028    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR029    | 1-216-295-00 | SHORT       | 0       |
|          |              | <FUSE HOLDER>                                                            |                                           | JR030    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR031    | 1-216-295-00 | SHORT       | 0       |
| FH600    | 1-533-217-31 | HOLDER, FUSE                                                             |                                           | JR032    | 1-216-295-00 | SHORT       | 0       |
| FH601    | 1-533-217-31 | HOLDER, FUSE                                                             |                                           | JR033    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR034    | 1-216-295-00 | SHORT       | 0       |
|          |              | <IC>                                                                     |                                           | JR035    | 1-216-295-00 | SHORT       | 0       |
| IC001    | 8-759-526-43 | IC TDA9874H/V1,118                                                       |                                           | JR036    | 1-216-295-00 | SHORT       | 0       |
| IC031    | 8-759-645-07 | IC LB1943N                                                               |                                           | JR037    | 1-216-295-00 | SHORT       | 0       |
| IC101    | 8-759-831-27 | IC HD6432197Y-PAL                                                        |                                           | JR038    | 1-216-295-00 | SHORT       | 0       |
|          |              | (ED115/ED215/ED313/ED515/<br>ED616/ED815/ED817/ED818/ED915/EZ715)        |                                           | JR039    | 1-216-295-00 | SHORT       | 0       |
| IC101    | 8-759-831-28 | IC HD6432197Y-PALG                                                       |                                           | JR040    | 1-216-295-00 | SHORT       | 0       |
|          |              | (EXCEPT ED115/ED215/ED313/ED515/<br>ED616/ED815/ED817/ED818/ED915/EZ715) |                                           | JR041    | 1-216-295-00 | SHORT       | 0       |
| IC141    | 8-759-580-62 | IC MM1256AFBE                                                            |                                           | JR042    | 1-216-295-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR043    | 1-216-295-00 | SHORT       | 0       |
| IC142    | 8-759-575-71 | IC M24C04-WMN6T                                                          |                                           | JR044    | 1-216-295-00 | SHORT       | 0       |
| IC201    | 8-759-589-31 | IC HA118217F                                                             |                                           | JR045    | 1-216-295-00 | SHORT       | 0       |
| IC291    | 8-759-566-07 | IC LA7277M-TLM                                                           | (ED616/ED817/<br>ED818/ED915/ED919/EZ717) | JR046    | 1-216-295-00 | SHORT       | 0       |
| IC301    | 8-759-638-56 | IC TDA9605H/N2,557                                                       |                                           | JR047    | 1-216-295-00 | SHORT       | 0       |
| IC451    | 8-759-643-83 | IC UPD16315GB-3BS                                                        |                                           | JR101    | 1-216-296-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR102    | 1-216-296-00 | SHORT       | 0       |
| IC502    | 8-749-015-48 | IC RPM6940                                                               |                                           | JR103    | 1-216-296-00 | SHORT       | 0       |
| △ IC600  | 8-749-018-38 | IC MA8910                                                                |                                           | JR104    | 1-216-296-00 | SHORT       | 0       |
| △ IC601  | 8-759-420-19 | IC AN1431T-TA                                                            |                                           | JR105    | 1-216-296-00 | SHORT       | 0       |
| IC660    | 8-759-438-18 | IC PQ12RD08                                                              |                                           | JR106    | 1-216-296-00 | SHORT       | 0       |
| IC662    | 8-759-471-81 | IC PQ05RD11                                                              |                                           | JR107    | 1-216-296-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR108    | 1-216-296-00 | SHORT       | 0       |
|          |              | <CHIP CONDUCTOR>                                                         |                                           | JR109    | 1-216-296-00 | SHORT       | 0       |
| JR001    | 1-216-295-00 | SHORT                                                                    | 0                                         | JR110    | 1-216-296-00 | SHORT       | 0       |
| JR002    | 1-216-295-00 | SHORT                                                                    | 0                                         | JR111    | 1-216-296-00 | SHORT       | 0       |
| JR003    | 1-216-295-00 | SHORT                                                                    | 0                                         | JR112    | 1-216-296-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR113    | 1-216-296-00 | SHORT       | 0       |
|          |              |                                                                          |                                           | JR114    | 1-216-296-00 | SHORT       | 0       |

**Note :**  
The components identified by  
mark △ or dotted line with mark  
△ are critical for safety.  
Replace only with part number  
specified.

| Ref. No.          | Part No.     | Description | Remarks                                                       |
|-------------------|--------------|-------------|---------------------------------------------------------------|
| JR115             | 1-216-296-00 | SHORT       | 0                                                             |
| JR116             | 1-216-296-00 | SHORT       | 0                                                             |
| JR117             | 1-216-296-00 | SHORT       | 0                                                             |
| JR118             | 1-216-296-00 | SHORT       | 0                                                             |
| JR119             | 1-216-296-00 | SHORT       | 0                                                             |
| JR120             | 1-216-296-00 | SHORT       | 0                                                             |
| JR121             | 1-216-296-00 | SHORT       | 0                                                             |
| JR122             | 1-216-296-00 | SHORT       | 0                                                             |
| JR123             | 1-216-296-00 | SHORT       | 0                                                             |
| JR124             | 1-216-296-00 | SHORT       | 0                                                             |
| JR125             | 1-216-296-00 | SHORT       | 0                                                             |
| JR126             | 1-216-296-00 | SHORT       | 0                                                             |
| JR127             | 1-216-296-00 | SHORT       | 0                                                             |
| JR128             | 1-216-296-00 | SHORT       | 0                                                             |
| JR129             | 1-216-296-00 | SHORT       | 0                                                             |
| JR130             | 1-216-296-00 | SHORT       | 0                                                             |
| JR131             | 1-216-296-00 | SHORT       | 0                                                             |
| JR132             | 1-216-296-00 | SHORT       | 0                                                             |
| <JUMPER SELECTOR> |              |             |                                                               |
| JS103             | 1-216-295-00 | SHORT       | 0<br>(EXCEPT EZ111/EZ414/EZ715/EZ717)                         |
| JS151             | 1-216-295-00 | SHORT       | 0                                                             |
| JS152             | 1-216-295-00 | SHORT       | 0                                                             |
| JS203             | 1-216-296-00 | SHORT       | 0                                                             |
| JS204             | 1-216-296-00 | SHORT       | 0                                                             |
| JS291             | 1-216-296-00 | SHORT       | 0 (ED115/ED215/ED313/<br>ED515/ED815/EZ111/EZ212/EZ414/EZ715) |
| JS309             | 1-216-295-00 | SHORT       | 0                                                             |
| JS379             | 1-216-296-00 | SHORT       | 0                                                             |
| JS664             | 1-216-295-00 | SHORT       | 0                                                             |
| JS703             | 1-216-295-00 | SHORT       | 0                                                             |
| JS705             | 1-216-295-00 | SHORT       | 0                                                             |
| JS718             | 1-216-295-00 | SHORT       | 0<br>(ED815/ED817/ED818)                                      |
| JS719             | 1-216-295-00 | SHORT       | 0<br>(ED815/ED817/ED818)                                      |
| JS720             | 1-216-296-00 | SHORT       | 0<br>(ED815/ED817/<br>ED818/ED915/ED919/EZ715/EZ717)          |
| JS721             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS722             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS723             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS734             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS737             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS738             | 1-216-295-00 | SHORT       | 0<br>(ED915/ED919/EZ715/EZ717)                                |
| JS901             | 1-216-295-00 | SHORT       | 0                                                             |
| JS902             | 1-216-295-00 | SHORT       | 0 (ED815/ED817/<br>ED818/ED915/ED919/EZ715/EZ717)             |
| JS904             | 1-216-295-00 | SHORT       | 0<br>(ED515/ED616/EZ414)                                      |
| JS905             | 1-216-296-00 | SHORT       | 0                                                             |
| JS906             | 1-216-295-00 | SHORT       | 0 (ED115/ED215/<br>ED313/ED515/ED616/EZ111/EZ212/EZ414)       |

| Ref. No.                     | Part No.     | Description                 | Remarks                                                         |
|------------------------------|--------------|-----------------------------|-----------------------------------------------------------------|
|                              |              | <COIL>                      |                                                                 |
| L006                         | 1-412-945-11 | INDUCTOR                    | 3.3uH                                                           |
| L071                         | 1-414-185-51 | INDUCTOR                    | 22uH<br>(ED313/EZ111/EZ212)                                     |
| L072                         | 1-414-179-51 | INDUCTOR                    | 2.2uH                                                           |
| L151                         | 1-414-185-51 | INDUCTOR                    | 22uH                                                            |
| L171                         | 1-414-185-51 | INDUCTOR                    | 22uH                                                            |
| L172                         | 1-414-185-51 | INDUCTOR                    | 22uH                                                            |
| L173                         | 1-410-509-11 | INDUCTOR                    | 10uH                                                            |
| L202                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L203                         | 1-414-857-51 | INDUCTOR                    | 100uH<br>(EXCEPT ED115/ED215/ED313/EZ111/EZ212)                 |
| L203                         | 1-410-520-11 | INDUCTOR                    | 82uH<br>(ED115/ED215/ED313/EZ111/EZ21)                          |
| L204                         | 1-410-510-11 | INDUCTOR                    | 12uH                                                            |
| L205                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L206                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L207                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L211                         | 1-414-193-51 | INDUCTOR                    | 220uH<br>(EXCEPT ED115/<br>ED215/ED313/ED817/EZ111/EZ212/EZ414) |
| L214                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L215                         | 1-414-187-51 | INDUCTOR                    | 47uH                                                            |
| L372                         | 1-414-857-51 | INDUCTOR                    | 100uH                                                           |
| L381                         | 1-414-857-51 | INDUCTOR                    | 100uH<br>(ED616/ED818/ED915)                                    |
| L601                         | 1-403-588-11 | INDUCTOR                    | 22uH                                                            |
| L602                         | 1-403-588-11 | INDUCTOR                    | 22uH                                                            |
| L603                         | 1-414-142-11 | INDUCTOR                    | 1uH                                                             |
| L604                         | 1-414-142-11 | INDUCTOR                    | 1uH                                                             |
| L606                         | 1-414-142-11 | INDUCTOR                    | 1uH                                                             |
| L660                         | 1-410-519-11 | INDUCTOR                    | 68uH                                                            |
| L700                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L701                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L702                         | 1-414-856-51 | INDUCTOR                    | 10uH                                                            |
| L705                         | 1-414-856-51 | INDUCTOR                    | 10uH<br>(ED915/ED919/EZ715/EZ717)                               |
| L901                         | 1-414-857-51 | INDUCTOR                    | 100uH                                                           |
| <FILTER>                     |              |                             |                                                                 |
| △LF600                       | 1-416-929-11 | FILTER, LINE                |                                                                 |
| <FLOURESCENT TUBE INDICATOR> |              |                             |                                                                 |
| ND451                        | 1-517-734-11 | TUBE, FLUORESCENT INDICATOR |                                                                 |
| <PHOTO COUPLER>              |              |                             |                                                                 |
| PH001                        | 8-749-013-23 | PHOTO INTERRUPTER GP3S120   |                                                                 |
| PH002                        | 8-749-013-23 | PHOTO INTERRUPTER GP3S120   |                                                                 |
| △PH600                       | 8-749-010-64 | PHOTO COUPLER PC123FY2      |                                                                 |
| <IC LINK>                    |              |                             |                                                                 |
| △PS071                       | 1-576-384-21 | LINK, IC                    |                                                                 |
| △PS072                       | 1-576-384-21 | LINK, IC                    |                                                                 |
| △PS331                       | 1-533-586-51 | LINK, IC                    |                                                                 |
| △PS661                       | 1-576-384-21 | LINK, IC                    |                                                                 |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety.  
Replace only with part number specified.

| Ref. No.     | Part No.     | Description               | Remarks             | Ref. No. | Part No.     | Description | Remarks       |
|--------------|--------------|---------------------------|---------------------|----------|--------------|-------------|---------------|
| <TRANSISTOR> |              |                           |                     | R035     | 1-216-689-11 | RES-CHIP    | 39K 5% 1/10W  |
| Q001         | 8-729-043-84 | TRANSISTOR PT380F3        |                     | R051     | 1-249-425-11 | CARBON      | 4.7K 5% 1/4W  |
| Q002         | 8-729-043-84 | TRANSISTOR PT380F3        |                     | R052     | 1-216-065-00 | RES-CHIP    | 4.7K 5% 1/10W |
| Q003         | 8-729-281-53 | TRANSISTOR 2SC1815GR-TPE2 |                     | R053     | 1-247-843-11 | CARBON      | 3.3K 5% 1/4W  |
| Q151         | 8-729-421-22 | TRANSISTOR UN2211-TX      | (ED919)             | R056     | 1-249-425-11 | CARBON      | 4.7K 5% 1/4W  |
| Q152         | 8-729-424-08 | TRANSISTOR UN2111-TX      | (ED919)             | R057     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| Q153         | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX |                     | R071     | 1-216-103-00 | RES-CHIP    | 180K 5% 1/10W |
| Q171         | 8-729-421-22 | TRANSISTOR UN2211-TX      |                     | R072     | 1-216-089-00 | RES-CHIP    | 47K 5% 1/10W  |
| Q172         | 8-729-216-22 | TRANSISTOR 2SB709A-QRS-TX |                     | R073     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| Q174         | 8-729-421-22 | TRANSISTOR UN2211-TX      |                     | R074     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| Q191         | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX | (ED616/ED818/EZ717) | R075     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| Q192         | 8-729-421-22 | TRANSISTOR UN2211-TX      | (ED616/ED818/EZ717) | R076     | 1-249-417-11 | CARBON      | 1K 5% 1/4W    |
| Q201         | 8-729-216-22 | TRANSISTOR 2SB709A-QRS-TX |                     | R100     | 1-216-085-00 | RES-CHIP    | 33K 5% 1/10W  |
| Q202         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R101     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| Q203         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R101     | 1-216-077-91 | RES-CHIP    | 15K 5% 1/10W  |
| Q204         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R101     | 1-216-069-00 | RES-CHIP    | 6.8K 5% 1/10W |
| Q206         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R102     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| Q210         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R103     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| Q211         | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX |                     | R104     | 1-247-807-31 | CARBON      | 100 5% 1/4W   |
| Q301         | 8-729-216-21 | TRANSISTOR 2SA1162Y-TE85L |                     | R105     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| Q302         | 8-729-230-49 | TRANSISTOR 2SC2712Y-TE85L |                     | R107     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| Q303         | 8-729-230-49 | TRANSISTOR 2SC2712Y-TE85L |                     | R108     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| Q372         | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX |                     | R109     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| Q373         | 8-729-422-27 | TRANSISTOR 2SD601A-QRS-TX |                     | R110     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| Q374         | 8-729-424-18 | TRANSISTOR UN2113-TX      |                     | R111     | 1-216-081-00 | RES-CHIP    | 22K 5% 1/10W  |
| Q375         | 8-729-012-31 | TRANSISTOR 2SC4040-TL2-Q  |                     | R112     | 1-216-041-00 | RES-CHIP    | 470 5% 1/10W  |
| Q376         | 8-729-900-51 | TRANSISTOR UN2115-QRS(TX) |                     | R113     | 1-216-041-00 | RES-CHIP    | 470 5% 1/10W  |
| Q377         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R114     | 1-216-041-00 | RES-CHIP    | 470 5% 1/10W  |
| Q378         | 8-729-421-19 | TRANSISTOR UN2213-TX      | (ED616/ED818/ED915) | R115     | 1-216-041-00 | RES-CHIP    | 470 5% 1/10W  |
| Q380         | 8-729-900-51 | TRANSISTOR UN2115-QRS(TX) | (ED616/ED818/ED915) | R116     | 1-216-089-00 | RES-CHIP    | 47K 5% 1/10W  |
| Q381         | 8-729-012-31 | TRANSISTOR 2SC4040-TL2-Q  | (ED616/ED818/ED915) | R117     | 1-249-417-11 | CARBON      | 1K 5% 1/4W    |
| Q701         | 8-729-106-68 | TRANSISTOR 2SD1664-T100-R |                     | R118     | 1-216-089-00 | RES-CHIP    | 47K 5% 1/10W  |
| Q706         | 8-729-421-19 | TRANSISTOR UN2213-TX      |                     | R119     | 1-216-089-00 | RES-CHIP    | 47K 5% 1/10W  |
| Q707         | 8-729-119-76 | TRANSISTOR 2SA1309A-QRSTA |                     | R120     | 1-216-089-00 | RES-CHIP    | 47K 5% 1/10W  |
| Q901         | 8-729-216-22 | TRANSISTOR 2SB709A-QRS-TX |                     | R121     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| <RESISTOR>   |              |                           |                     | R122     | 1-216-121-11 | RES-CHIP    | 1M 5% 1/10W   |
| R001         | 1-249-413-11 | CARBON                    | 470 5% 1/4W         | R123     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| R002         | 1-216-073-00 | RES-CHIP                  | 10K 5% 1/10W        | R124     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| R003         | 1-249-421-11 | CARBON                    | 2.2K 5% 1/4W        | R125     | 1-249-437-11 | CARBON      | 47K 5% 1/4W   |
| R004         | 1-216-057-00 | RES-CHIP                  | 2.2K 5% 1/10W       | R126     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| R005         | 1-249-401-11 | CARBON                    | 47 5% 1/4W          | R127     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| R006         | 1-249-401-11 | CARBON                    | 47 5% 1/4W          | R128     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| R007         | 1-249-437-11 | CARBON                    | 47K 5% 1/4W         | R129     | 1-249-441-11 | CARBON      | 100K 5% 1/4W  |
| R008         | 1-249-437-11 | CARBON                    | 47K 5% 1/4W         | R130     | 1-216-049-00 | RES-CHIP    | 1K 5% 1/10W   |
| R009         | 1-249-433-11 | CARBON                    | 22K 5% 1/4W         | R131     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| R010         | 1-249-433-11 | CARBON                    | 22K 5% 1/4W         | R132     | 1-249-429-11 | CARBON      | 10K 5% 1/4W   |
| R011         | 1-216-304-11 | RES-CHIP                  | 3.3 5% 1/10W        | R133     | 1-216-121-11 | RES-CHIP    | 1M 5% 1/10W   |
| R012         | 1-216-304-11 | RES-CHIP                  | 3.3 5% 1/10W        | R142     | 1-247-887-00 | CARBON      | 220K 5% 1/4W  |
| R013         | 1-216-001-00 | RES-CHIP                  | 10 5% 1/10W         | R143     | 1-216-113-00 | RES-CHIP    | 470K 5% 1/10W |
| R014         | 1-216-295-00 | SHORT                     | 0                   | R144     | 1-216-105-91 | RES-CHIP    | 220K 5% 1/10W |
| R015         | 1-216-295-00 | SHORT                     | 0                   | R151     | 1-216-113-00 | RES-CHIP    | 470K 5% 1/10W |
| R016         | 1-216-033-00 | RES-CHIP                  | 220 5% 1/10W        | R152     | 1-216-025-11 | RES-CHIP    | 100 5% 1/10W  |
| R032         | 1-216-089-00 | RES-CHIP                  | 47K 5% 1/10W        | R153     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |
| R034         | 1-216-689-11 | RES-CHIP                  | 39K 5% 1/10W        | R154     | 1-216-097-11 | RES-CHIP    | 100K 5% 1/10W |
|              |              |                           |                     | R155     | 1-216-121-11 | RES-CHIP    | 1M 5% 1/10W   |
|              |              |                           |                     | R156     | 1-249-435-11 | CARBON      | 33K 5% 1/4W   |
|              |              |                           |                     | R157     | 1-216-073-00 | RES-CHIP    | 10K 5% 1/10W  |

| Ref. No. | Part No.     | Description                                                                        | Remarks |
|----------|--------------|------------------------------------------------------------------------------------|---------|
| R158     | 1-216-073-00 | RES-CHIP 10K 5%                                                                    | 1/10W   |
| R159     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R160     | 1-216-041-00 | RES-CHIP 470 5%                                                                    | 1/10W   |
| R161     | 1-216-065-00 | RES-CHIP 4.7K 5%                                                                   | 1/10W   |
| R162     | 1-216-073-00 | RES-CHIP 10K 5%                                                                    | 1/10W   |
| R163     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R164     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R165     | 1-249-429-11 | CARBON 10K 5%                                                                      | 1/4W    |
| R166     | 1-216-295-00 | SHORT 0                                                                            |         |
| R167     | 1-216-295-00 | SHORT 0                                                                            |         |
| R171     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R172     | 1-247-807-31 | CARBON 100 5%                                                                      | 1/4W    |
| R174     | 1-216-045-00 | RES-CHIP 680 5%                                                                    | 1/10W   |
| R175     | 1-216-041-00 | RES-CHIP 470 5%                                                                    | 1/10W   |
| R177     | 1-216-065-00 | RES-CHIP 4.7K 5%                                                                   | 1/10W   |
| R178     | 1-216-295-00 | SHORT 0<br>(ED115/ED215/ED313/ED515/ED616/<br>ED815/ED817/ED818/ED915/ED919/EZ414) |         |
| R191     | 1-216-089-00 | RES-CHIP 47K 5%<br>(ED616/ED818/EZ717)                                             | 1/10W   |
| R192     | 1-216-073-00 | RES-CHIP 10K 5%                                                                    | 1/10W   |
| R193     | 1-216-073-00 | RES-CHIP 10K 5%                                                                    | 1/10W   |
| R194     | 1-216-073-00 | RES-CHIP 10K 5%                                                                    | 1/10W   |
| R201     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R202     | 1-216-041-00 | RES-CHIP 470 5%                                                                    | 1/10W   |
| R202     | 1-216-033-00 | RES-CHIP 220 5%<br>(ED115/ED215/ED313/EZ111/EZ212)                                 | 1/10W   |
| R204     | 1-216-083-00 | RES-CHIP 27K 5%                                                                    | 1/10W   |
| R205     | 1-216-069-00 | RES-CHIP 6.8K 5%                                                                   | 1/10W   |
| R206     | 1-216-053-00 | RES-CHIP 1.5K 5%                                                                   | 1/10W   |
| R207     | 1-216-065-00 | RES-CHIP 4.7K 5%                                                                   | 1/10W   |
| R208     | 1-216-069-00 | RES-CHIP 6.8K 5%                                                                   | 1/10W   |
| R208     | 1-216-077-91 | RES-CHIP 15K 5%<br>(ED115/ED215/ED313/EZ111/EZ212)                                 | 1/10W   |
| R208     | 1-216-073-00 | RES-CHIP 10K 5%<br>(ED616/ED817/ED818/ED915/ED919)                                 | 1/10W   |
| R209     | 1-216-069-00 | RES-CHIP 6.8K 5%<br>(ED515/ED815/EZ414/EZ717)                                      | 1/10W   |
| R209     | 1-216-049-00 | RES-CHIP 1K 5%<br>(EXCEPT ED515/ED815/EZ414/EZ717)                                 | 1/10W   |
| R211     | 1-216-295-00 | SHORT 0<br>(ED616/ED817/ED818/ED915/ED919)                                         |         |
| R212     | 1-216-063-91 | RES-CHIP 3.9K 5%<br>(ED115/ED215/ED313/ED515/<br>ED815/EZ111/EZ212/EZ414/EZ717)    | 1/10W   |
| R214     | 1-216-025-11 | RES-CHIP 100 5%<br>(ED515/ED616/<br>ED817/ED818/ED915/ED919/EZ717)                 | 1/10W   |
| R215     | 1-216-025-11 | RES-CHIP 100 5%                                                                    | 1/10W   |
| R216     | 1-247-807-31 | CARBON 100 5%                                                                      | 1/4W    |
| R217     | 1-216-041-00 | RES-CHIP 470 5%<br>(ED915/EZ111/EZ212/EZ414/EZ717)                                 | 1/10W   |
| R218     | 1-216-065-00 | RES-CHIP 4.7K 5%                                                                   | 1/10W   |
| R219     | 1-259-880-11 | CARBON 2.2M 5%                                                                     | 1/4W    |
| R222     | 1-216-033-00 | RES-CHIP 220 5%                                                                    | 1/10W   |
| R223     | 1-216-033-00 | RES-CHIP 220 5%                                                                    | 1/10W   |
| R224     | 1-216-049-00 | RES-CHIP 1K 5%                                                                     | 1/10W   |
| R225     | 1-249-417-11 | CARBON 1K 5%                                                                       | 1/4W    |
| R226     | 1-216-099-00 | RES-CHIP 120K 5%                                                                   | 1/10W   |

| Ref. No. | Part No.     | Description                                            | Remarks |
|----------|--------------|--------------------------------------------------------|---------|
| R227     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R228     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R289     | 1-216-049-00 | RES-CHIP 1K 5%<br>(ED616/ED817/ED818/ED915/ED919)      | 1/10W   |
| R291     | 1-208-806-11 | METAL CHIP 10K 0.5%<br>(ED616/ED817/ED818/ED915/ED919) | 1/10W   |
| R294     | 1-247-807-31 | CARBON 100 5%<br>(ED616/ED817/ED818/ED915/ED919)       | 1/4W    |
| R295     | 1-247-807-31 | CARBON 100 5%<br>(ED616/ED817/ED818/ED915/ED919)       | 1/4W    |
| R296     | 1-249-428-11 | CARBON 8.2K 5%<br>(ED616/ED817/ED818/ED915/ED919)      | 1/4W    |
| R299     | 1-216-071-00 | RES-CHIP 8.2K 5%<br>(ED616/ED817/ED818/ED915/ED919)    | 1/10W   |
| R301     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |
| R302     | 1-216-079-00 | RES-CHIP 18K 5%                                        | 1/10W   |
| R304     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R305     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R306     | 1-216-083-00 | RES-CHIP 27K 5%                                        | 1/10W   |
| R307     | 1-216-057-00 | RES-CHIP 2.2K 5%                                       | 1/10W   |
| R308     | 1-208-820-11 | METAL CHIP 39K 0.5%                                    | 1/10W   |
| R309     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R310     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R311     | 1-216-057-00 | RES-CHIP 2.2K 5%                                       | 1/10W   |
| R312     | 1-216-083-00 | RES-CHIP 27K 5%                                        | 1/10W   |
| R313     | 1-216-133-00 | RES-CHIP 3.3M 5%                                       | 1/10W   |
| R314     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |
| R317     | 1-216-061-00 | RES-CHIP 3.3K 5%                                       | 1/10W   |
| R318     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R319     | 1-216-049-00 | RES-CHIP 1K 5%                                         | 1/10W   |
| R322     | 1-216-295-00 | SHORT 0                                                |         |
| R327     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R328     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R329     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R350     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |
| R351     | 1-216-061-00 | RES-CHIP 3.3K 5%                                       | 1/10W   |
| R352     | 1-216-101-00 | RES-CHIP 150K 5%                                       | 1/10W   |
| R353     | 1-216-025-11 | RES-CHIP 100 5%                                        | 1/10W   |
| R354     | 1-216-085-00 | RES-CHIP 33K 5%                                        | 1/10W   |
| R355     | 1-216-079-00 | RES-CHIP 18K 5%                                        | 1/10W   |
| R356     | 1-216-083-00 | RES-CHIP 27K 5%                                        | 1/10W   |
| R357     | 1-216-295-00 | SHORT 0                                                |         |
| R358     | 1-216-077-91 | RES-CHIP 15K 5%<br>(ED515/ED616)                       | 1/10W   |
| R359     | 1-249-437-11 | CARBON 47K 5%<br>(ED515/ED616)                         | 1/4W    |
| R360     | 1-216-077-91 | RES-CHIP 15K 5%                                        | 1/10W   |
| R361     | 1-249-437-11 | CARBON 47K 5%                                          | 1/4W    |
| R362     | 1-216-077-91 | RES-CHIP 15K 5%                                        | 1/10W   |
| R363     | 1-249-437-11 | CARBON 47K 5%                                          | 1/4W    |
| R364     | 1-216-295-00 | SHORT 0                                                |         |
| R365     | 1-216-065-00 | RES-CHIP 4.7K 5%                                       | 1/10W   |
| R366     | 1-216-041-00 | RES-CHIP 470 5%                                        | 1/10W   |
| R368     | 1-216-125-00 | RES-CHIP 1.5M 5%                                       | 1/10W   |
| R370     | 1-216-089-00 | RES-CHIP 47K 5%                                        | 1/10W   |
| R371     | 1-249-411-11 | CARBON 330 5%                                          | 1/4W    |
| R372     | 1-249-411-11 | CARBON 330 5%                                          | 1/4W    |
| R375     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |
| R376     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |
| R378     | 1-216-073-00 | RES-CHIP 10K 5%                                        | 1/10W   |

| Ref. No. | Part No.     | Description | Remarks                        |      |       | Ref. No. | Part No.     | Description          | Remarks |    |                                      |
|----------|--------------|-------------|--------------------------------|------|-------|----------|--------------|----------------------|---------|----|--------------------------------------|
| R379     | 1-249-433-11 | CARBON      | 22K                            | 5%   | 1/4W  | △ R640   | 1-219-153-11 | FUSIBLE              | 10      | 5% | 1/4W                                 |
| R380     | 1-216-308-00 | RES-CHIP    | 4.7                            | 5%   | 1/10W | △ R641   | 1-219-153-11 | FUSIBLE              | 10      | 5% | 1/4W                                 |
|          |              |             | (EXCEPT ED616/ED818/ED915)     |      |       | R643     | 1-216-353-00 | METAL OXIDE          | 2.2     | 5% | 1W                                   |
| R380     | 1-216-005-00 | RES-CHIP    | 15                             | 5%   | 1/10W |          |              |                      |         |    |                                      |
|          |              |             | (ED616/ED818/ED915)            |      |       | R647     | 1-215-465-00 | METAL                | 68K     | 1% | 1/4W                                 |
| R382     | 1-216-081-00 | RES-CHIP    | 22K                            | 5%   | 1/10W | R648     | 1-216-057-00 | RES-CHIP             | 2.2K    | 5% | 1/10W                                |
|          |              |             | (ED616/ED818/ED915)            |      |       | R649     | 1-249-401-11 | CARBON               | 47      | 5% | 1/4W                                 |
| R383     | 1-216-001-00 | RES-CHIP    | 10                             | 5%   | 1/10W | R651     | 1-215-459-00 | METAL                | 39K     | 1% | 1/4W                                 |
|          |              |             | (ED616/ED818/ED915)            |      |       | R668     | 1-216-073-00 | RES-CHIP             | 10K     | 5% | 1/10W                                |
| R384     | 1-216-089-00 | RES-CHIP    | 47K                            | 5%   | 1/10W | R701     | 1-247-807-31 | CARBON               | 100     | 5% | 1/4W                                 |
|          |              |             | (ED616/ED818/ED915)            |      |       | R702     | 1-249-413-11 | CARBON               | 470     | 5% | 1/4W                                 |
| R385     | 1-216-057-00 | RES-CHIP    | 2.2K                           | 5%   | 1/10W | R703     | 1-216-295-00 | SHORT                | 0       |    |                                      |
|          |              |             | (ED515/ED616)                  |      |       | R704     | 1-249-413-11 | CARBON               | 470     | 5% | 1/4W                                 |
| R386     | 1-216-057-00 | RES-CHIP    | 2.2K                           | 5%   | 1/10W | R708     | 1-216-295-00 | SHORT                | 0       |    |                                      |
| R387     | 1-216-057-00 | RES-CHIP    | 2.2K                           | 5%   | 1/10W | R709     | 1-216-113-00 | RES-CHIP             | 470K    | 5% | 1/10W                                |
| R400     | 1-216-021-00 | RES-CHIP    | 68                             | 5%   | 1/10W | R710     | 1-216-097-11 | RES-CHIP             | 100K    | 5% | 1/10W                                |
| R401     | 1-249-410-11 | CARBON      | 270                            | 5%   | 1/4W  | R711     | 1-249-433-11 | CARBON               | 22K     | 5% | 1/4W                                 |
|          |              |             | (EZ715/EZ717)                  |      |       | R727     | 1-216-295-00 | SHORT                | 0       |    |                                      |
| R402     | 1-249-408-11 | CARBON      | 180                            | 5%   | 1/4W  |          |              |                      |         |    | (ED915/ED919/EZ715/EZ717)            |
|          |              |             | (ED115/ED215/ED616/            |      |       | R728     | 1-216-295-00 | SHORT                | 0       |    |                                      |
|          |              |             | ED817/ED818/ED915/ED919/EZ717) |      |       | △ R730   | 1-240-307-81 | FUSIBLE              | 560     | 5% | 1/4W                                 |
| R404     | 1-249-437-11 | CARBON      | 47K                            | 5%   | 1/4W  | R733     | 1-249-413-11 | CARBON               | 470     | 5% | 1/4W                                 |
|          |              |             |                                |      |       |          |              |                      |         |    | (ED915/ED919/EZ715/EZ717)            |
| R405     | 1-249-437-11 | CARBON      | 47K                            | 5%   | 1/4W  | R734     | 1-249-413-11 | CARBON               | 470     | 5% | 1/4W                                 |
| R410     | 1-249-403-11 | CARBON      | 68                             | 5%   | 1/4W  |          |              |                      |         |    | (ED915/ED919/EZ715/EZ717)            |
| R411     | 1-249-419-11 | CARBON      | 1.5K                           | 5%   | 1/4W  | R738     | 1-216-295-00 | SHORT                | 0       |    |                                      |
| R414     | 1-216-061-00 | RES-CHIP    | 3.3K                           | 5%   | 1/10W | R740     | 1-216-035-00 | RES-CHIP             | 270     | 5% | 1/10W                                |
| R415     | 1-216-065-00 | RES-CHIP    | 4.7K                           | 5%   | 1/10W |          |              |                      |         |    | (ED815/ED817/                        |
|          |              |             |                                |      |       |          |              |                      |         |    | ED818/ED915/ED919/EZ715/EZ717)       |
| R416     | 1-249-427-11 | CARBON      | 6.8K                           | 5%   | 1/4W  | R742     | 1-216-047-91 | RES-CHIP             | 820     | 5% | 1/10W                                |
| R417     | 1-249-431-11 | CARBON      | 15K                            | 5%   | 1/4W  | R901     | 1-216-097-11 | RES-CHIP             | 100K    | 5% | 1/10W                                |
| R418     | 1-216-089-00 | RES-CHIP    | 47K                            | 5%   | 1/10W |          |              |                      |         |    | (ED815/ED817/                        |
| R424     | 1-216-061-00 | RES-CHIP    | 3.3K                           | 5%   | 1/10W |          |              |                      |         |    | ED818/ED915/ED919/EZ715/EZ717)       |
| R425     | 1-216-065-00 | RES-CHIP    | 4.7K                           | 5%   | 1/10W | R902     | 1-216-097-11 | RES-CHIP             | 100K    | 5% | 1/10W                                |
|          |              |             |                                |      |       |          |              |                      |         |    | (ED815/ED817/                        |
| R426     | 1-216-069-00 | RES-CHIP    | 6.8K                           | 5%   | 1/10W |          |              |                      |         |    | ED818/ED915/ED919/EZ715/EZ717)       |
| R427     | 1-216-077-91 | RES-CHIP    | 15K                            | 5%   | 1/10W | R905     | 1-216-041-00 | RES-CHIP             | 470     | 5% | 1/10W                                |
| R428     | 1-216-089-00 | RES-CHIP    | 47K                            | 5%   | 1/10W |          |              |                      |         |    | (ED815/ED817/                        |
| R451     | 1-249-413-11 | CARBON      | 470                            | 5%   | 1/4W  |          |              |                      |         |    | ED818/ED915/ED919/EZ715/EZ717)       |
| R452     | 1-216-049-00 | RES-CHIP    | 1K                             | 5%   | 1/10W | R906     | 1-216-041-00 | RES-CHIP             | 470     | 5% | 1/10W                                |
|          |              |             |                                |      |       |          |              |                      |         |    |                                      |
| R453     | 1-216-049-00 | RES-CHIP    | 1K                             | 5%   | 1/10W | R908     | 1-216-023-00 | RES-CHIP             | 82      | 5% | 1/10W                                |
| R454     | 1-216-049-00 | RES-CHIP    | 1K                             | 5%   | 1/10W | R909     | 1-249-407-11 | CARBON               | 150     | 5% | 1/4W                                 |
| R455     | 1-249-417-11 | CARBON      | 1K                             | 5%   | 1/4W  | R910     | 1-216-025-11 | RES-CHIP             | 100     | 5% | 1/10W                                |
| R457     | 1-216-065-00 | RES-CHIP    | 4.7K                           | 5%   | 1/10W | R913     | 1-249-408-11 | CARBON               | 180     | 5% | 1/4W                                 |
| R458     | 1-216-065-00 | RES-CHIP    | 4.7K                           | 5%   | 1/10W | R914     | 1-216-021-00 | RES-CHIP             | 68      | 5% | 1/10W                                |
|          |              |             |                                |      |       |          |              |                      |         |    |                                      |
| R459     | 1-216-085-00 | RES-CHIP    | 33K                            | 5%   | 1/10W |          |              |                      |         |    |                                      |
| R526     | 1-249-437-11 | CARBON      | 47K                            | 5%   | 1/4W  |          |              |                      |         |    |                                      |
| R601     | 1-214-949-21 | METAL       | 3.3M                           | 1%   | 1/2W  |          |              |                      |         |    |                                      |
| R602     | 1-247-883-00 | CARBON      | 150K                           | 5%   | 1/4W  |          |              |                      |         |    |                                      |
| R603     | 1-247-891-00 | CARBON      | 330K                           | 5%   | 1/4W  |          |              |                      |         |    |                                      |
|          |              |             |                                |      |       |          |              |                      |         |    |                                      |
| R604     | 1-249-430-11 | CARBON      | 12K                            | 5%   | 1/4W  | S101     | 1-571-958-11 | SWITCH, PUSH (1 KEY) |         |    |                                      |
| R605     | 1-249-419-11 | CARBON      | 1.5K                           | 5%   | 1/4W  | S102     | 1-771-155-11 | SWITCH, ROTARY       |         |    |                                      |
| R606     | 1-215-444-00 | METAL       | 9.1K                           | 1%   | 1/4W  | S454     | 1-771-574-21 | SWITCH, TACTILE      |         |    |                                      |
| R607     | 1-249-428-11 | CARBON      | 8.2K                           | 5%   | 1/4W  | S458     | 1-771-574-21 | SWITCH, TACTILE      |         |    | (EZ715/EZ717)                        |
| △ R611   | 1-260-364-11 | CARBON      | 1M                             | 5%   | 1/2W  | S459     | 1-771-574-21 | SWITCH, TACTILE      |         |    |                                      |
|          |              |             |                                |      |       |          |              |                      |         |    |                                      |
| R612     | 1-208-789-11 | METAL CHIP  | 2K                             | 0.5% | 1/10W | S465     | 1-771-574-21 | SWITCH, TACTILE      |         |    |                                      |
| R613     | 1-249-406-11 | CARBON      | 120                            | 5%   | 1/4W  | S466     | 1-771-574-21 | SWITCH, TACTILE      |         |    |                                      |
| R614     | 1-216-655-11 | METAL CHIP  | 1.5K                           | 0.5% | 1/10W | S467     | 1-771-574-21 | SWITCH, TACTILE      |         |    |                                      |
| R615     | 1-216-057-00 | RES-CHIP    | 2.2K                           | 5%   | 1/10W | S468     | 1-771-574-21 | SWITCH, TACTILE      |         |    | (ED115/ED215/                        |
| R616     | 1-249-401-11 | CARBON      | 47                             | 5%   | 1/4W  |          |              |                      |         |    | ED616/ED817/ED818/ED915/ED919/EZ717) |
|          |              |             |                                |      |       |          |              |                      |         |    |                                      |
| R617     | 1-249-417-11 | CARBON      | 1K                             | 5%   | 1/4W  |          |              |                      |         |    |                                      |
| R618     | 1-249-409-11 | CARBON      | 220                            | 5%   | 1/4W  |          |              |                      |         |    |                                      |

**Note :**  
The components identified by  
mark △ or dotted line with mark  
△ are critical for safety.  
Replace only with part number  
specified.

# MA-402

# NK-11

| Ref. No.      | Part No.      | Description                   | Remarks           |
|---------------|---------------|-------------------------------|-------------------|
| <TRANSFORMER> |               |                               |                   |
| T371          | 1-423-414-11  | TRANSFORMER, BIAS OSCILLATION |                   |
| T372          | 1-423-415-11  | TRANSFORMER, BIAS OSCILLATION |                   |
|               |               | (ED616/ED818/ED915)           |                   |
| △ T600        | 1-435-790-11  | TRANSFORMER, CONVERTER        |                   |
| <TUNER>       |               |                               |                   |
| TU701         | 1-693-544-11  | TUNER, (BTF-3MG403)           |                   |
|               |               | (EXCEPT ED919)                |                   |
| TU701         | 1-693-543-11  | TUNER (BTF-3MG412)            | (ED919)           |
| <VARISTOR>    |               |                               |                   |
| △ VDR600      | 1-801-267-31  | VARISTOR TNR10V431K660        |                   |
| <CRYSTAL>     |               |                               |                   |
| X001          | 1-767-897-12  | VIBRATOR, CRYSTAL             | 24.576 MHz        |
| X101          | 1-767-855-11  | VIBRATOR, CRYSTAL             | 10MHz             |
| X102          | 1-579-463-11  | VIBRATOR, CRYSTAL             | 32.768 KHz        |
| X151          | 1-767-856-11  | VIBRATOR, CRYSTAL             | 17.734475 MHz     |
| X152          | 1-767-857-11  | VIBRATOR, CRYSTAL             | 14.31818 MHz      |
|               |               | (ED919)                       |                   |
| X201          | 1-760-708-11  | VIBRATOR, CRYSTAL             | 4.433619 MHz      |
| X202          | *1-760-709-11 | VIBRATOR, CRYSTAL             | 3579.545 KHz      |
|               |               | (EXCEPT EZ111/EZ212/EZ414)    |                   |
| <CAPACITOR>   |               |                               |                   |
| C003          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C004          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C005          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C006          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C007          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C008          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C009          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C010          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C011          | 1-164-232-11  | CERAMIC CHIP                  | 0.01uF 50V        |
| C012          | 1-164-232-11  | CERAMIC CHIP                  | 0.01uF 50V        |
| C013          | 1-163-243-11  | CERAMIC CHIP                  | 47PF 5.00% 50V    |
| C014          | 1-164-232-11  | CERAMIC CHIP                  | 0.01uF 50V        |
| C015          | 1-163-231-11  | CERAMIC CHIP                  | 15PF 5.00% 50V    |
| C016          | 1-163-233-11  | CERAMIC CHIP                  | 18PF 5.00% 50V    |
| C017          | 1-110-501-11  | CERAMIC CHIP                  | 0.33uF 10.00% 16V |
| C018          | 1-163-989-11  | CERAMIC CHIP                  | 0.033uF 10% 25V   |
| C019          | 1-109-982-11  | CERAMIC CHIP                  | 1uF 10.00% 10V    |
| C020          | 1-164-004-11  | CERAMIC CHIP                  | 0.1uF 10% 25V     |
| C021          | 1-113-642-11  | TANTALUM CHIP                 | 47uF 10.00% 10V   |
| C022          | 1-107-823-11  | CERAMIC CHIP                  | 0.47uF 10.00% 16V |
| C023          | 1-163-243-11  | CERAMIC CHIP                  | 47PF 5.00% 50V    |

**Note :**  
The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

| Ref. No.         | Part No.           | Description                            | Remarks        |
|------------------|--------------------|----------------------------------------|----------------|
| < CONNECTOR >    |                    |                                        |                |
| * CN001          | 1-691-183-11       | CONNECTOR (BOARD TO BOARD) 13P         |                |
| < DIODE >        |                    |                                        |                |
| D001             | 8-719-066-72       | DIODE BB135                            |                |
| < FERRITE BEAD > |                    |                                        |                |
| FB001            | 1-543-813-21       | FERRITE 0uH                            |                |
| FB002            | 1-543-813-21       | FERRITE 0uH                            |                |
| FB003            | 1-543-813-21       | FERRITE 0uH                            |                |
| < IC >           |                    |                                        |                |
| IC001            | 8-759-526-43       | IC TDA9874H/V1, 118                    |                |
| < COIL >         |                    |                                        |                |
| L006             | 1-412-945-11       | INDUCTOR                               | 3.3uH          |
| < IC LINK >      |                    |                                        |                |
| △ PS001          | 1-576-122-21       | LINK, IC (0.4A)                        |                |
| < RESISTOR >     |                    |                                        |                |
| R001             | 1-216-071-00       | METAL CHIP                             | 8.2K 5% 1/10W  |
| R002             | 1-216-073-00       | METAL CHIP                             | 10K 5% 1/10W   |
| R003             | 1-216-689-11       | METAL CHIP                             | 39K 0.5% 1/10W |
| R004             | 1-216-689-11       | METAL CHIP                             | 39K 0.5% 1/10W |
| R005             | 1-216-041-00       | METAL CHIP                             | 470 5% 1/10W   |
| R006             | 1-216-041-00       | METAL CHIP                             | 470 5% 1/10W   |
| R007             | 1-216-001-00       | METAL CHIP                             | 10 5% 1/10W    |
| R008             | 1-216-001-00       | METAL CHIP                             | 10 5% 1/10W    |
| R009             | 1-216-001-00       | METAL CHIP                             | 10 5% 1/10W    |
| R010             | 1-216-001-00       | METAL CHIP                             | 10 5% 1/10W    |
| R011             | 1-216-304-11       | METAL CHIP                             | 3.3 5% 1/10W   |
| R012             | 1-216-304-11       | METAL CHIP                             | 3.3 5% 1/10W   |
| R013             | 1-216-001-00       | METAL CHIP                             | 10 5% 1/10W    |
| R014             | 1-216-295-00       | METAL CHIP                             | 0 5% 1/10W     |
| R015             | 1-216-295-00       | METAL CHIP                             | 0 5% 1/10W     |
| R016             | 1-216-033-00       | METAL CHIP                             | 220 5% 1/10W   |
| < VIBRATOR >     |                    |                                        |                |
| X001             | 1-767-897-12       | VIBRATOR, CRYSTAL                      | 24.576MHz      |
| MISCELLANEOUS    |                    |                                        |                |
| *****            |                    |                                        |                |
| 1-757-665-11     | CORD, POWER        | (EXCEPT EZ111/EZ212/EZ414/EZ715/EZ717) |                |
| 1-777-855-51     | CORD, POWER        | (EZ111/EZ212/EZ414/EZ715/EZ717)        |                |
| 1-757-690-11     | FLAT CABLE FMD-022 | (EXCEPT EZ115/ED215/ED313/EZ111/EZ212) |                |
| 1-757-691-11     | FLAT CABLE FMD-023 | (ED115/ED215/ED313/EZ111/EZ212)        |                |
| 1-757-551-11     | FLAT CABLE FAC-009 |                                        |                |

| Ref. No. | Part No.     | Description                                                              | Remarks |
|----------|--------------|--------------------------------------------------------------------------|---------|
|          | 1-757-552-12 | FLAT CABLE FDM-010                                                       |         |
|          | 1-757-553-11 | FLAT CABLE FDI-002                                                       |         |
|          | 1-500-471-11 | FE HEAD                                                                  |         |
|          | A-6759-620-A | HEAD BLOCK ASSY, ACE                                                     |         |
|          | 1-763-572-11 | MOTOR, DC                                                                |         |
|          | X-3950-970-1 | MOTOR ASSY, CAM (SL)                                                     |         |
|          | 1-772-360-11 | DRUM ASSY, DZH-89D-R<br>(ED115/ED215/ED313/EZ111/EZ212)                  |         |
|          | 1-796-012-11 | DRUM ASSY, DZH-0D1A-R<br>(ED815/ED817/ED818/<br>ED915/ED919/EZ715/EZ717) |         |
|          | 1-796-011-11 | DRUM ASSY, DZH-0D0A-R<br>(ED515/ED616/EZ414)                             |         |

ACCESSORIES  
\*\*\*\*\*

|              |                                                                   |  |
|--------------|-------------------------------------------------------------------|--|
| 1-696-593-31 | CORD, CONNECTION (PAL)                                            |  |
| 3-065-583-11 | MANUAL, INSTRUCTION<br>(ED115/ED215/ED313)                        |  |
| 3-065-581-11 | MANUAL, INSTRUCTION<br>(ED515/ED616/ED815/ED817/ED818/ED915)      |  |
| 3-065-580-11 | MANUAL, INSTRUCTION (ED919)                                       |  |
| 3-065-579-11 | MANUAL, INSTRUCTION (EZ111/EZ715)                                 |  |
| 3-065-578-11 | MANUAL, INSTRUCTION<br>(EZ212/EZ414/EZ717)                        |  |
| 1-476-475-11 | COMMANDER, STANDARD (RMT-V311)<br>(ED115/ED215/ED313/ED515/ED815) |  |
| 1-476-475-21 | COMMANDER, STANDARD (RMT-V311A)<br>(ED817/ED915)                  |  |

| Ref. No. | Part No.     | Description                                      | Remarks |
|----------|--------------|--------------------------------------------------|---------|
|          | 1-476-475-21 | COMMANDER, STANDARD (RMT-V311E)<br>(EZ111)       |         |
|          | 1-476-475-41 | COMMANDER, STANDARD (RMT-V311C)<br>(ED919)       |         |
|          | 1-476-475-31 | COMMANDER, STANDARD (RMT-V311B)<br>(ED616/ED818) |         |
|          | 1-476-475-61 | COMMANDER, STANDARD (RMT-V311E)<br>(EZ715)       |         |
|          | 1-476-475-51 | COMMANDER, STANDARD (RMT-V311D)<br>(EZ212/EZ414) |         |
|          | 1-476-473-11 | COMMANDER, STANDARD (RMT-V309)<br>(EZ717)        |         |
|          | 1-569-008-21 | ADAPTOR, CONVERSION 2P<br>(ED313/ED616/ED818)    |         |
|          | 1-770-019-11 | ADAPTOR, CONVERSION PLUG 3P<br>(ED919)           |         |

HARDWARE LIST  
\*\*\*\*\*

|    |              |                                                                                                 |
|----|--------------|-------------------------------------------------------------------------------------------------|
|    | 7-682-647-09 | SCREW +PS 3X6                                                                                   |
| #1 | 7-685-648-79 | SCREW +BVTP 3X12 TYPE2 IT-3                                                                     |
| #2 | 7-685-646-79 | SCREW +BVTP 3X8 TYPE2                                                                           |
| #3 | 7-682-647-09 | SCREW +P 3X6                                                                                    |
| #4 | 7-685-133-19 | SCREW +P 2.6X6 TYPE2 NON-SLIT                                                                   |
|    | 4-921-277-41 | SCREW (B2.6X8), TAPPING, BIND                                                                   |
|    | 3-979-112-01 | SCREW SW(+)BVTP 3X10<br>(ED115/ED215/ED313/ED515/ED616/<br>ED815/ED817/ED818/ED915/ED919/EZ717) |
|    | 3-342-512-21 | SCREW (B1.7X3.5), TAPPING<br>(ED115/ED215/ED313/ED515/<br>ED616/ED817/ED818/ED915/ED919/EZ717)  |

